

RF

TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
Camera Hub G3

ISSUED TO
Konec Solutions Pty Ltd

Level 3, 5 Talavera Rd, Macquarie Park NSW 2113 Australia



Tested by:	Zhang Zhenwu	Report No:	BL-SZ21C0720-603
	Zhang Zhenwu	EUT Name:	Camera Hub G3
Date	Jan. 25, 2022	Model Name:	CH-H03
		Brand Name:	Aqara
		Test Standard:	AS/NZS 4268:2017 (refer section 3)
Approved by:	Jianming Liao	Test Conclusion:	Pass
	Liao Jianming (Technical Director)	Test Date:	Dec. 29, 2021 ~ Jan. 18, 2022
Date	Jan. 25, 2022	Date of Issue:	Jan. 25, 2022

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Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Jan. 25, 2022</u>	<u>Initial Issue</u>

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20°C to 25°C
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

- (1) The test report reference to the report template version v1.9.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Konec Solutions Pty Ltd
Address	Level 3, 5 Talavera Rd, Macquarie Park NSW 2113 Australia

2.2 Manufacturer Information

Manufacturer	Lumi United Technology Co., Ltd.
Address	8th Floor, JinQi Wisdom Valley, No.1 Tangling Road, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Camera Hub G3
Model Name Under Test	CH-H03
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V1.0.1
Software Version	V1.0.1
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

General technical information:

Network and Wireless connectivity	WIFI 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac Band 1/2/3, 5.8G SRD, ZigBee
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The requirement for the following technical information of the EUT was tested in this report:

Frequency Range	Low Sub-band: 5.15 GHz – 5.35 GHz High Sub-band: 5.47 GHz – 5.725 GHz
Modulation technology	OFDM
Modulation Type	802.11a/ n: 64QAM, 16QAM, BPSK, QPSK 802.11ac: 256QAM, 64QAM, 16QAM, BPSK, QPSK
Transfer Rate (Mbps) (Single RF path)	802.11a: 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6 Mbps 802.11n: up to 150 Mbps 802.11ac: up to VHT-MCS9
Antenna Type	Steel Disc Antenna
Antenna Gain	2.0 dBi (In test items related to antenna gain, the final results reflect this figure. This value is provided by the applicant.)
The Max RF Output power	16.7 dBm

Product information for Adaptivity:

Channel Access Mechanism	
<input type="checkbox"/> Frame Based Equipment	<input type="checkbox"/> Initiating Device <input type="checkbox"/> Responding Device <input type="checkbox"/> Initiating Device and Responding Device
<input checked="" type="checkbox"/> Load Based Equipment	<input type="checkbox"/> Supervising Device <input checked="" type="checkbox"/> Supervised Device <input type="checkbox"/> Supervising and as a Supervised Device
Priority Classes implemented by the Load Based Equipment	
<input type="checkbox"/> Operating as a Supervising Device	<input type="checkbox"/> Priority Class 4 <input type="checkbox"/> Priority Class 3 <input type="checkbox"/> Priority Class 2 (<input type="checkbox"/> Note 1, <input type="checkbox"/> Note 2) <input type="checkbox"/> Priority Class 1 (<input type="checkbox"/> Note 1)
<input checked="" type="checkbox"/> Operating as a Supervised Device	<input type="checkbox"/> Priority Class 4 <input type="checkbox"/> Priority Class 3 <input checked="" type="checkbox"/> Priority Class 2 (<input type="checkbox"/> Note 1) <input type="checkbox"/> Priority Class 1 (<input type="checkbox"/> Note 1)
Energy Detection Threshold Level (TL)	
<input type="checkbox"/> Frame Based Equipment	For PH ≤ 13 dBm : TL = -75 dBm/MHz; For 13 dBm < PH < 23 dBm : TL = -85 dBm/MHz + (23 dBm - PH); For PH ≥ 23 dBm : TL = -85 dBm/MHz
<input checked="" type="checkbox"/> Load Based Equipment	<input checked="" type="checkbox"/> Option 1: TL = -75 dBm/MHz <input type="checkbox"/> Option 2:

	For $\text{PH} \leq 13 \text{ dBm}$: $\text{TL} = -75 \text{ dBm/MHz}$ For $13 \text{ dBm} < \text{PH} < 23 \text{ dBm}$: $\text{TL} = -85 \text{ dBm/MHz} + (23 \text{ dBm} - \text{PH})$ For $\text{PH} \geq 23 \text{ dBm}$: $\text{TL} = -85 \text{ dBm/MHz}$
Channel Access Mechanism of EUT type	
<input type="checkbox"/> Frame Based Equipment	N/A
<input checked="" type="checkbox"/> Load Based Equipment	<input type="checkbox"/> Option A: verify Channel Access Mechanism <input checked="" type="checkbox"/> Option B: declaration by manufacturer
Channel Operation Mode	
<input checked="" type="checkbox"/> Single Channel Operation	N/A
<input checked="" type="checkbox"/> Multi-channel Operation	<input type="checkbox"/> Option 1: Load Based Equipment may use any combination/grouping of 20 MHz Operating Channels out of the list of channels (Nominal Centre Frequencies) provided in clause 4.2.1, if it satisfies the channel access requirements (Channel Access Mechanism) for an Initiating Device as described in clause 4.2.7.3.2.6 on each such 20 MHz Operating Channel.
	<input checked="" type="checkbox"/> Option 2: EN 301 893 figure 3 defines bonded 40 MHz, 80 MHz or 160 MHz channels (see also clause 4.2.1.3 for the channel number). Load Based Equipment that uses a combination/grouping of 20 MHz Operating Channels that is a subset of bonded 40 MHz, 80 MHz or 160 MHz channels, may transmit on any of the 20 MHz Operating Channels
	Note: For option 2, the manufacturer declared that, for the EUT in this report, the primary operating Channel is arbitrarily determined and not changed more than once per second.

Description of Test Modes

Low Sub-band: 5.15 GHz – 5.35 GHz

8 channels are provided for 802.11a/n/ac (20MHz):

Channel	Center Frequency (MHz)
36	5180
40	5200
44	5220
48	5240
52	5260
56	5280
60	5300
64	5320

4 channels are provided for 802.11n/ac (40MHz):

Channel	Center Frequency (MHz)
38	5190
46	5230
54	5270
62	5310

2 channels are provided for 802.11ac (80MHz):

Channel	Center Frequency(MHz)
42	5210
58	5290

High Sub-band: 5.47 GHz – 5.725 GHz

11 channels are provided for 802.11a/n/ac (20MHz):

Channel	Center Frequency(MHz)
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700

5 channels are provided for 802.11n/ac (40MHz):

Channel	Center Frequency(MHz)
102	5510
110	5550
118	5590
126	5630
134	5670

2 channels are provided for 802.11ac (80MHz):

Channel	Center Frequency(MHz)
106	5530
122	5610

Note: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Modulation Technology	Modulation Type	Low Sub-band	High Sub-band
					Channel	Channel
Center frequencies	11a	6	OFDM	BPSK	64/36	140/100
	11n(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11n(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11ac(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(80 MHz)	29.3	OFDM	BPSK	58/42	122/106
Nominal Channel Bandwidth and Occupied Channel Bandwidth	11a	6	OFDM	BPSK	64/36	140/100
	11n(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11n(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11ac(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(80 MHz)	29.3	OFDM	BPSK	58/42	122/106
RF output power	11a	6	OFDM	BPSK	64/36	140/100
	11n(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11n(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11ac(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(80 MHz)	29.3	OFDM	BPSK	58/42	122/106
Power density	11a	6	OFDM	BPSK	64/36	140/100
	11n(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11n(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11ac(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(80 MHz)	29.3	OFDM	BPSK	58/42	122/106
Transmitter unwanted emissions outside the 5 GHz RLAN bands	11a	6	OFDM	BPSK	64/36	140/100
	11n(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11n(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11ac(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(80 MHz)	29.3	OFDM	BPSK	58/42	122/106
Transmitter unwanted emissions within the 5 GHz RLAN bands	11a	6	OFDM	BPSK	64/36	140/100
	11n(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11n(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11ac(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(80 MHz)	29.3	OFDM	BPSK	58/42	122/106
Receiver spurious emissions	11a	6	OFDM	BPSK	64/36	140/100
	11n(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11n(40 MHz)	13.5	OFDM	BPSK	62/38	134/102
	11ac(20 MHz)	6.5	OFDM	BPSK	64/36	140/100
	11ac(40 MHz)	13.5	OFDM	BPSK	62/38	134/102

	11ac(80 MHz)	29.3	OFDM	BPSK	58/42	122/106
Dynamic Frequency Selection (DFS)	11a	6	OFDM	BPSK	52	100
	11ac(80 MHz)	29.3	OFDM	BPSK	58	106
Adaptivity (Channel Access Mechanism)	11ac(20 MHz)	6	OFDM	BPSK	36	/
	11ac(40 MHz)	13.5	OFDM	BPSK	38	/
Receiver Blocking	11a	6	OFDM	BPSK	36	140
User Access Restrictions	/	/	/	/	/	/
Geo-location capability	/	/	/	/	/	/

Mode	Low Sub-band			High Sub-band		
	Channel	Channel Number	Frequency (MHz)	Channel	Channel Number	Frequency (MHz)
11a	HIGH/LOW(H/L)	64/36	5320/5180	HIGH/LOW(H/L)	140/100	5700/5500
11n(20 MHz)	HIGH/LOW(H/L)	64/36	5320/5180	HIGH/LOW(H/L)	140/100	5700/5500
11n(40 MHz)	HIGH/LOW(H/L)	62/38	5310/5190	HIGH/LOW(H/L)	134/102	5670/5510
11ac(20 MHz)	HIGH/LOW(H/L)	64/36	5320/5180	HIGH/LOW(H/L)	140/100	5700/5500
11ac(40 MHz)	HIGH/LOW(H/L)	62/38	5310/5190	HIGH/LOW(H/L)	134/102	5670/5510
11ac(80 MHz)	HIGH/LOW(H/L)	58/42	5290/5210	HIGH/LOW(H/L)	122/106	5610/5530

Note: The above EUT information in section 2.3 and 2.4 was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.6 Additional Instructions

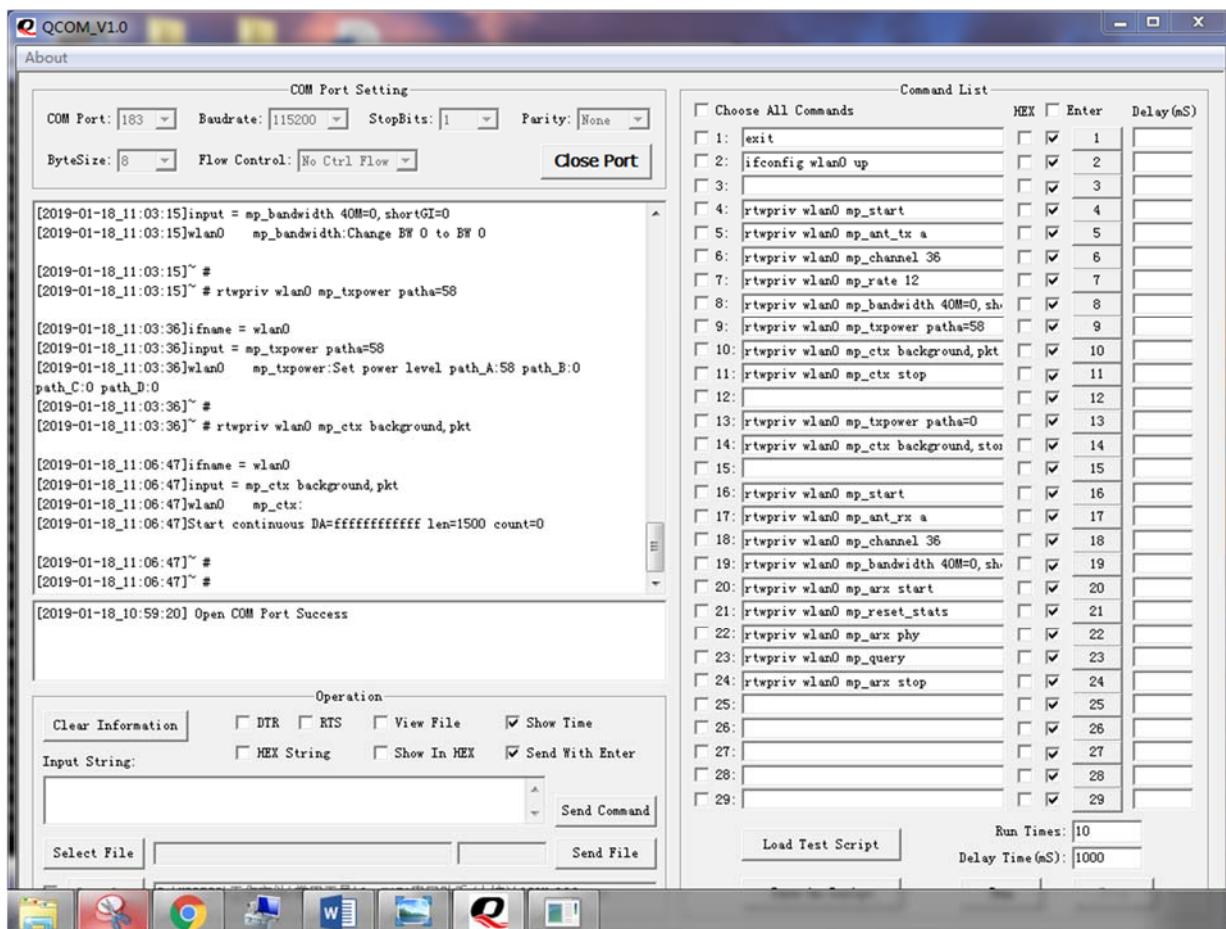
EUT Software Settings:

Mode	<input checked="" type="checkbox"/> Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually. And EUT is transmitting pseudo random data by itself.
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During testing. Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power level setup in software			
Test Software Version	QCOM		
Support Units (Software installation media)	Description	Manufacturer	Model
	Notebook	HP	N/A
Mode	Channel	Soft Set	
802.11a	All	58	
802.11n20	All	58	
802.11n40	All	58	
802.11ac20	All	58	
802.11ac40	All	58	
802.11ac80	All	58	

Run Software:



3 SUMMARY OF TEST RESULTS

No.	Identity	Document Title
1	AS/NZS 4268:2017	Radio equipment and systems - Short range devices - Limits and methods of measurement
2	ETSI EN 301 893 V2.1.1 (2017-05)	5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Test items and the results are as follows:

Report Section	Standard Rule	Description		Test Result	Verdict	Remark
5.1.1	4.2.1	Center frequencies		ANNEX A.1	Pass	--
5.1.2	4.2.2	Nominal Channel Bandwidth and Occupied Channel Bandwidth		ANNEX A.2	Pass	--
5.1.3	4.2.3	RF output power		ANNEX A.3	Pass	--
5.1.4		Power density		ANNEX A.4	Pass	
5.1.5	4.2.4	Transmitter unwanted emissions	Transmitter unwanted emissions outside the 5 GHz RLAN bands	ANNEX A.5	Pass	--
5.1.6			Transmitter unwanted emissions within the 5 GHz RLAN bands	ANNEX A.6	Pass	--
5.2.1	4.2.5	Receiver spurious emissions		ANNEX A.7	Pass	--
5.2.2	4.2.6	Dynamic Frequency Selection (DFS)		ANNEX A.8	Pass	--
5.2.3	4.2.7	Adaptivity (Channel Access Mechanism)		ANNEX A.9	Pass	--
5.2.4	4.2.8	Receiver Blocking		ANNEX A.10	Pass	--
5.2.5	4.2.9	User Access Restrictions		--	N/A	Note 1
5.2.6	4.2.10	Geo-location capability		--	N/A	Note 2

Note¹: The function of User Access Restrictions is declared by manufacturer, for more detailed description, please refer to the user manual.

Note²: This requirement does not apply to devices that do not support Geo-location capability.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

Relative Humidity	45% to 55%		
Atmospheric Pressure	100 kPa to 102 kPa		
Temperature	NT (Normal Temperature)	+22°C to +25°C	
	LT (Low Temperature)	-10°C	
	HT (High Temperature)	+40°C	
Working Voltage of the EUT	NV (Normal Voltage)	5.0 V	

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2021.08.09	2022.08.08
Spectrum Analyzer	KEYSIGHT	N9020A	MY56060183	2021.09.08	2022.09.07
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	260592	2021.01.27	2022.01.26
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2021.08.24	2022.08.23
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2021.06.01	2022.05.31
Bluetooth Signaling Unit	ROHDE&SCHWARZ	CMW270	100607	2021.06.01	2022.05.31
Bluetooth Signaling Unit	ROHDE&SCHWARZ	CMW500	142028	2021.06.01	2022.05.31
DC Power Supply	ITECH	IT6720	60010301071 7610007	2021.09.22	2022.09.21
Temperature Chamber	AHK	NTH64-40A	1310	2022.01.05	2023.01.04
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2021.09.13	2022.09.12
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2021.08.20	2024.08.19
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1917	2019.07.02	2022.07.01
Test Antenna-Horn (18-40 GHz)	A-INFO	LB-180400KF	J211060273	2021.07.02	2024.07.01
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2021.09.04	2024.09.03

4.3 MEASUREMENT UNCERTAINTY

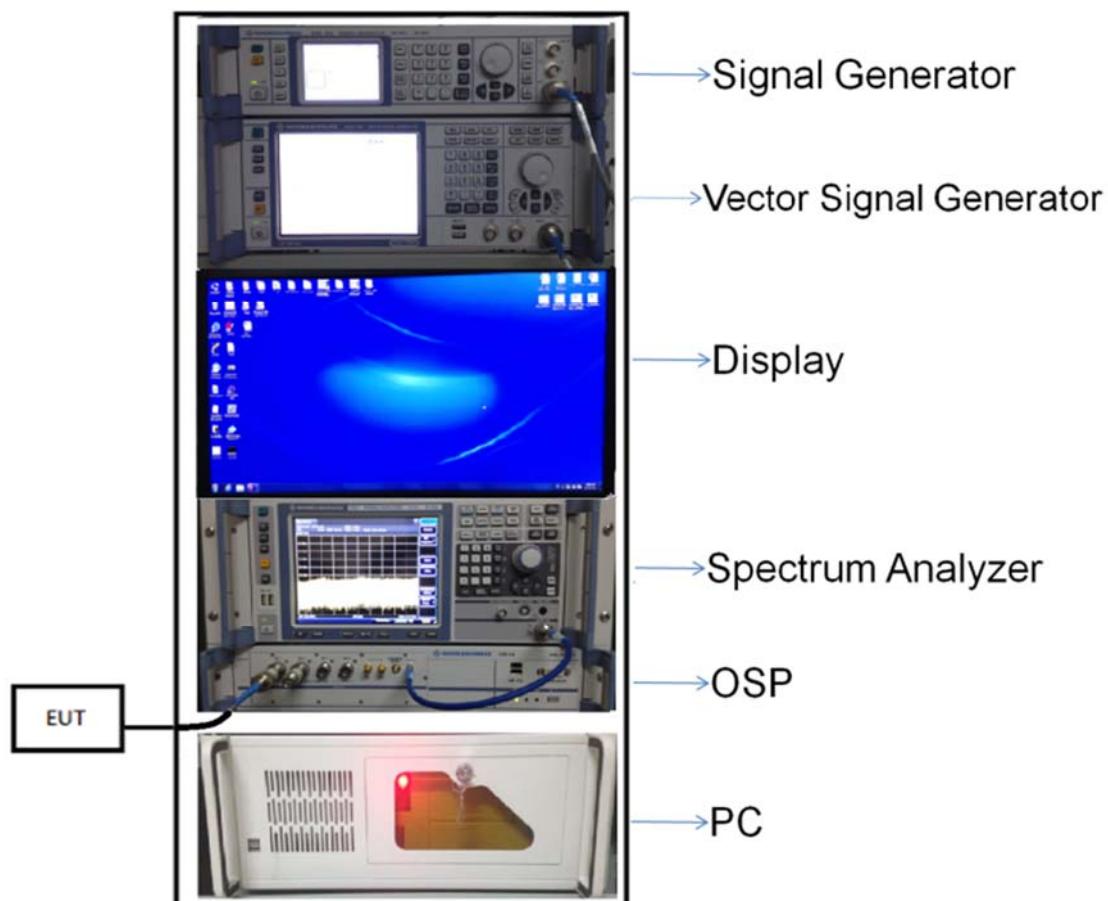
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Parameters	Uncertainty
RF frequency	3.2×10^{-6}
RF power conducted	0.66 dB
Spurious emissions, conducted	1.78 dB
Spurious emissions, radiated	5.36 dB
Humidity	4.1 %
Temperature	0.82°C
Time	1.2 %

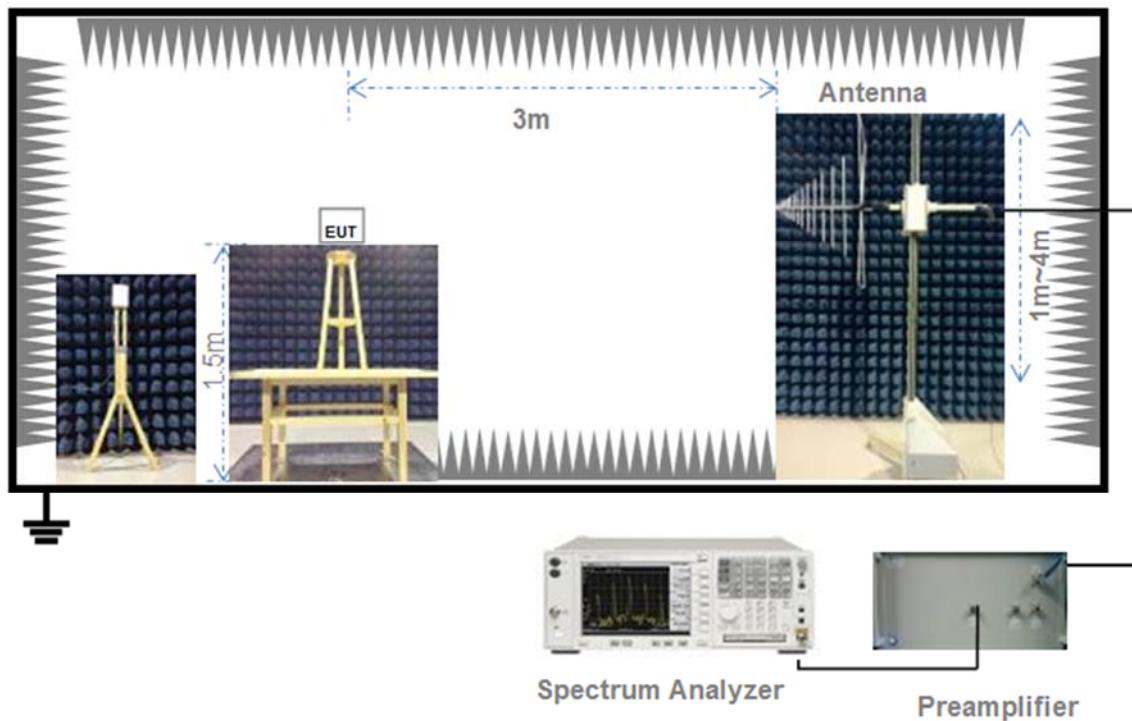
4.4 Description of Test Setup

4.4.1 For Conducted Test

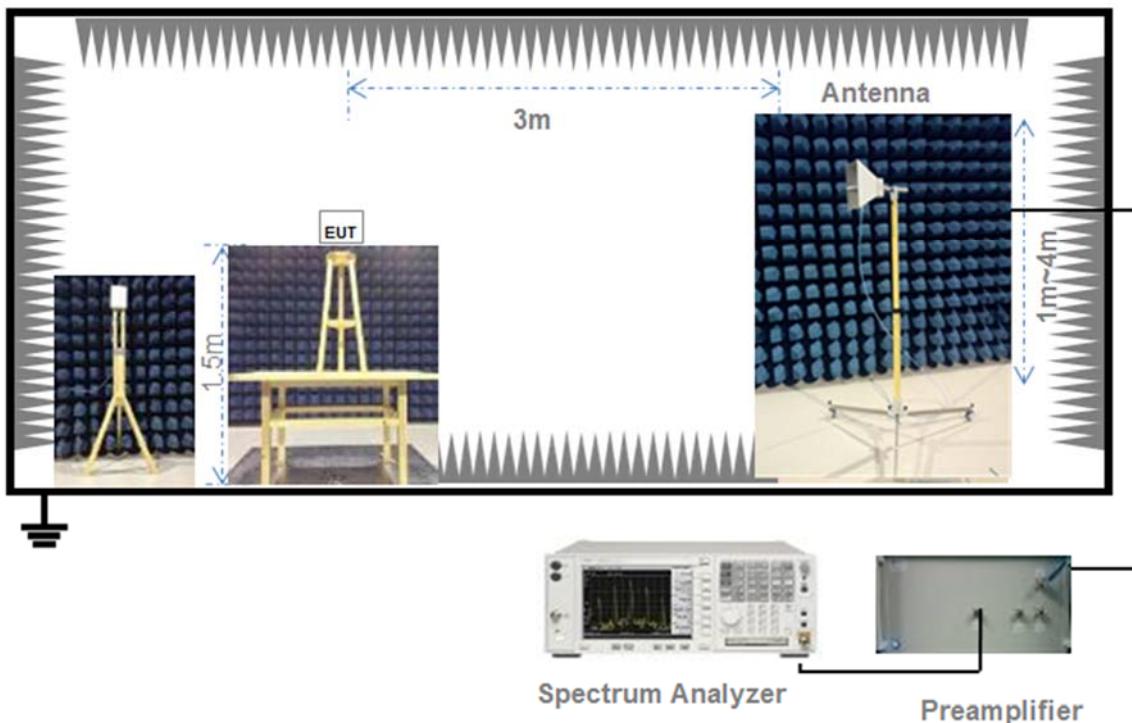


(Diagram 1)

4.4.2 For Radiated Test

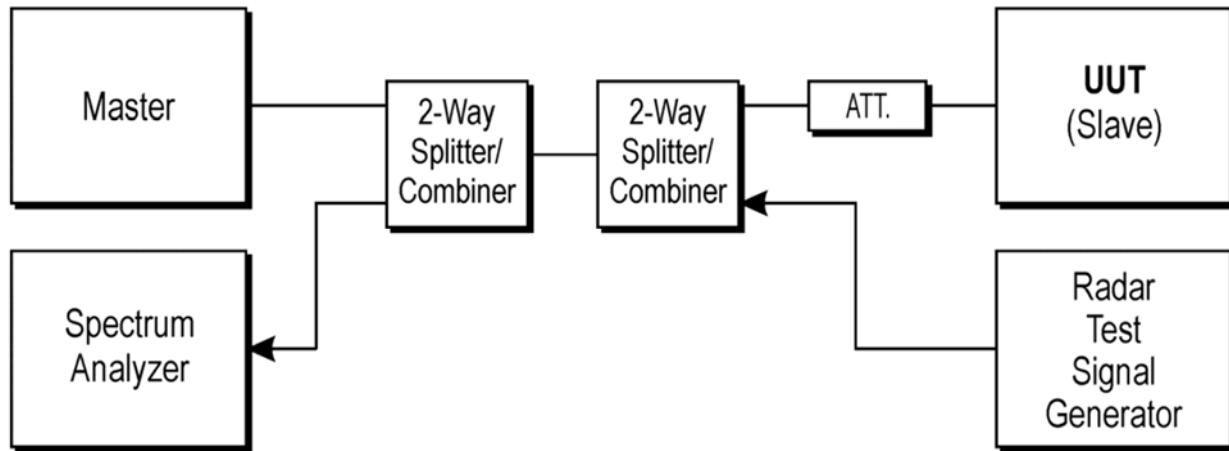


(Diagram 2)



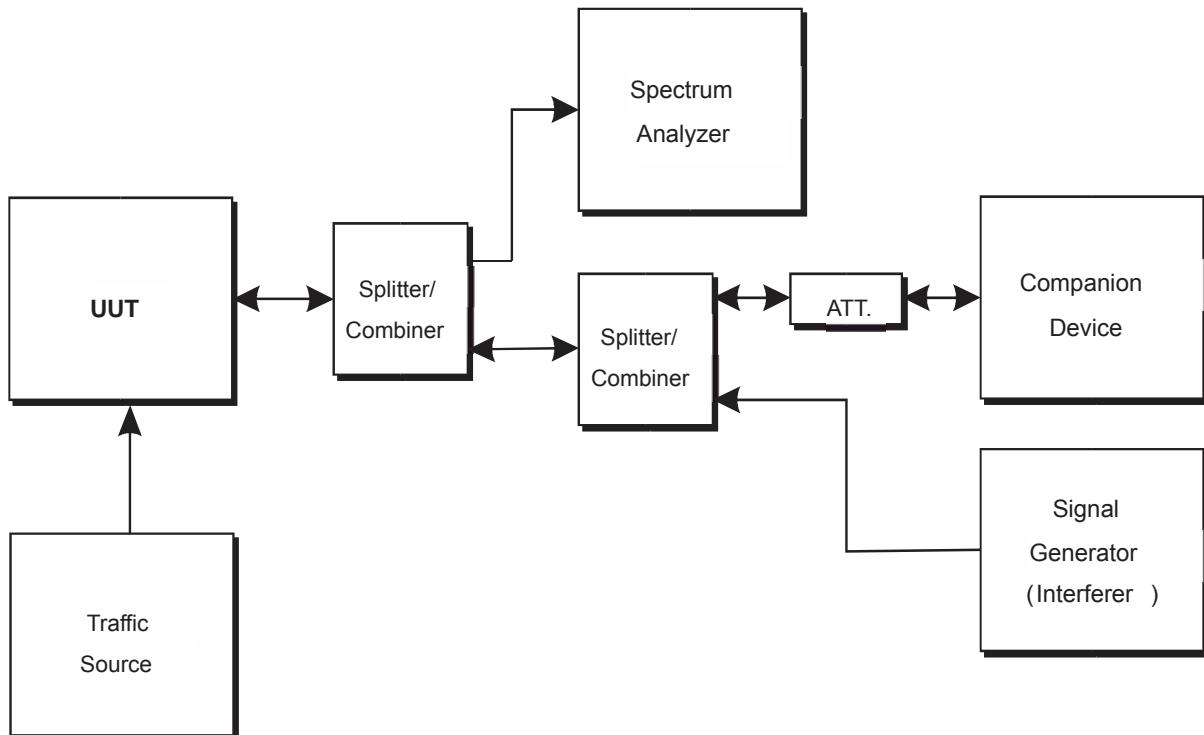
(Diagram 3)

4.4.3 For Dynamic Frequency Selection (DFS) Test



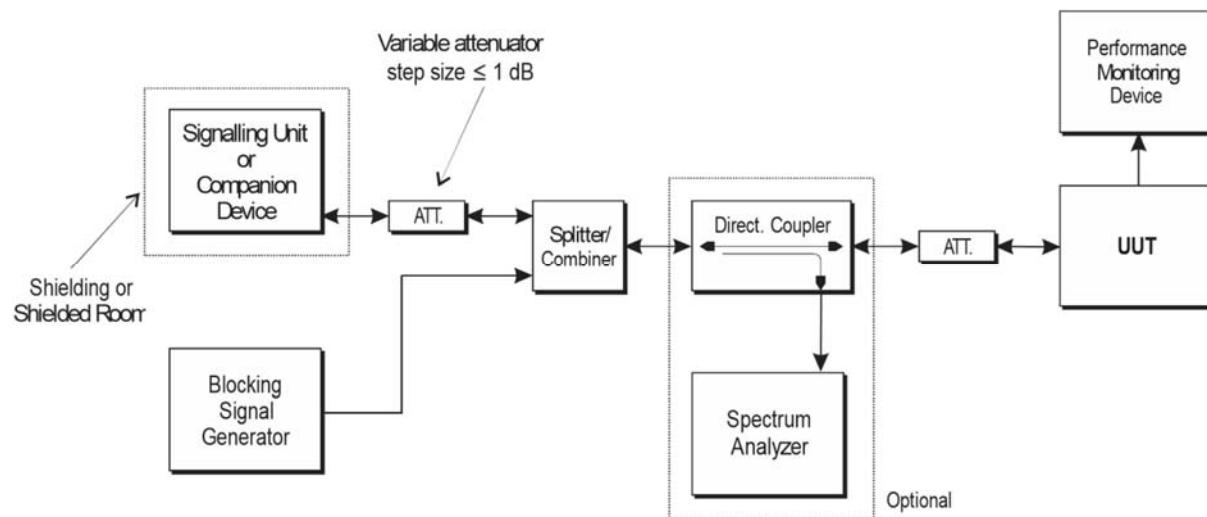
(Diagram 4)

4.4.4 For Adaptivity Test



(Diagram 5)

4.4.5 For Receiver Blocking Test



(Diagram 6)

5 Test Type and Test Results

5.1 Transmitter Parameters

5.1.1 Centre frequencies

5.1.1.1 Limit

The Nominal Centre Frequencies (fc) for a Nominal Channel Bandwidth of 20 MHz are defined by equation (1).

$$f_{cn} = 5\ 160 + (g \times 20) \text{ MHz, where } 0 \leq g \leq 9 \text{ or } 16 \leq g \leq 27 \quad (1)$$

A maximum offset of the Nominal Centre Frequency of ± 200 kHz is permitted. Where the manufacturer decides to make use of this frequency offset, the manufacturer shall declare the actual centre frequencies used by the equipment. (See clause 5.4.1, item a).

The actual centre frequency for any given channel shall be maintained within the range $fc \pm 20$ ppm.

Equipment may have simultaneous transmissions on more than one Operating Channel with a Nominal Channel Bandwidth of 20 MHz.

5.1.1.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test.

5.1.1.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.2.2

5.1.1.4 Test Result

Please refer to ANNEX A.1.

5.1.2 Nominal Channel Bandwidth and Occupied Channel Bandwidth

5.1.2.1 Limit

The Nominal Channel Bandwidth for a single Operating Channel shall be 20 MHz.

Alternatively, equipment may implement a lower Nominal Channel Bandwidth with a minimum of 5 MHz, providing they still comply with the Nominal Centre Frequencies defined in clause 4.2.1 (20 MHz raster).

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement. The Occupied Channel Bandwidth might change with time/payload.

During a Channel Occupancy Time (COT), equipment may operate temporarily with an Occupied Channel Bandwidth of less than 80 % of its Nominal Channel Bandwidth with a minimum of 2 MHz.

5.1.2.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test.

5.1.2.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.3.2

5.1.2.4 Test Result

Please refer to ANNEX A.2.

5.1.3 RF output power

5.1.3.1 Limit

The RF Output Power is the mean equivalent isotropically radiated power (e.i.r.p.) during a transmission burst.

Transmit Power Control (TPC) is a mechanism to be used by the RLAN device to ensure a mitigation factor of at least 3 dB on the aggregate power from a large number of devices. This requires the RLAN device to have a TPC range from which the lowest value is at least 6 dB below the values for mean e.i.r.p. given in table 1 for devices with TPC.

Limits for RF output power at the highest power level

Frequency range (MHz)	Mean e.i.r.p. limit (dBm)	
	With TPC	Without TPC
5150 to 5350	23	20/23(see note 1)
5470 to 5725	30(see note 2)	27(see note 2)

Note ¹: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.

Note ²: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

Limit for RF output power at the lowest power level of the TPC range

Frequency range (MHz)	Mean e.i.r.p. limit (dBm)
5250 to 5350	17
5470 to 5725	24(see note)

Note: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

5.1.3.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test.

5.1.3.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.4.2.1.1 and clause 5.4.4.2.1.2.

5.1.3.4 Test Result

Please refer to ANNEX A.3.

5.1.4 Power density

5.1.4.1 Limit

The Power Density is the mean equivalent isotropically radiated power (e.i.r.p.) density during a transmission burst.

Transmit Power Control (TPC) is a mechanism to be used by the RLAN device to ensure a mitigation factor of at least 3 dB on the aggregate power from a large number of devices. This requires the RLAN device to have a TPC range from which the lowest value is at least 6 dB below the values for mean e.i.r.p. given in table 1 for devices with TPC.

Frequency range (MHz)	Mean e.i.r.p. density limit (dBm/MHz)	
	With TPC	Without TPC
5150 to 5350	10	7/10(see Note ¹)
5470 to 5725	17(see Note ²)	14(see Note ²)

Note ¹: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.

Note ²: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

5.1.4.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test.

5.1.4.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.4.2.1.3

5.1.4.4 Test Result

Please refer to ANNEX A.4.

5.1.5 Transmitter unwanted emissions outside the 5 GHz RLAN bands

5.1.5.1 Limit

The level of transmitter unwanted emissions outside the 5 GHz RLAN bands shall not exceed the limits given in next table.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted) and to the emissions radiated by the cabinet. In case of integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Frequency range	Maximum power (dBm)	Bandwidth
30 MHz to 47 MHz	-36	100 kHz
47 MHz to 74 MHz	-54	100 kHz
74 MHz to 87.5 MHz	-36	100 kHz
87.5 MHz to 118 MHz	-54	100 kHz
118 MHz to 174 MHz	-36	100 kHz
174 MHz to 230 MHz	-54	100 kHz
230 MHz to 470 MHz	-36	100 kHz
470 MHz to 862 MHz	-54	100 kHz
862 MHz to 1 GHz	-36	100 kHz
1 GHz to 26 GHz	-30	1 MHz

Table : Transmitter unwanted emission limits outside the 5 GHz RLAN bands

5.1.5.2 Test Setup

See the section 4.4.1 and 4.4.2 (Diagram 1, 2, 3) for test setup description..

5.1.5.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.5.2

5.1.5.4 Test Result

Please refer to ANNEX A.5.

5.1.6 Transmitter unwanted emissions within the 5 GHz RLAN bands

5.1.6.1 Limit

The average level of the transmitted spectrum shall not exceed the limits given in the following figure:

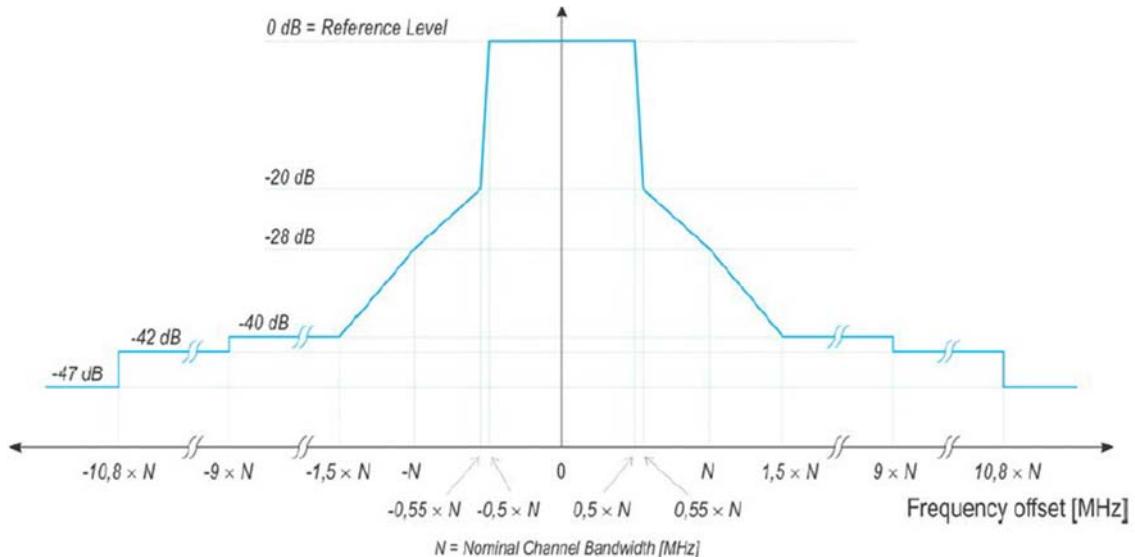


Figure 1: Transmit mask

Note ¹: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

Note ²: The mean Power Density (measured with a 1 MHz measurement bandwidth) of the transmitter unwanted emissions within the 5 GHz RLAN bands shall not exceed the limits of the mask provided in figure 1 or an absolute level of -30 dBm/MHz, whichever is greater. The limits in figure 1 are relative to the maximum Power Density of the RLAN device when measured with a reference bandwidth of 1 MHz.

5.1.6.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test.

5.1.6.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.6.2

5.1.6.4 Test Result

Please refer to ANNEX A.6.

5.2 Receiver Parameters

5.2.1 Receiver Spurious Emissions

5.2.1.1 Limit

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

The spurious emissions of the transmitter shall not exceed the values in following tables for the EUT in this report.

In case of equipment with antenna connectors, these limits apply to emissions at the antenna port (conducted). For emissions radiated by the cabinet or emissions radiated by integral antenna equipment (without antenna connectors), these limits are e.r.p. for emissions up to 1 GHz and e.i.r.p. for emissions above 1 GHz.

Frequency range	Maximum power (dBm)	Bandwidth
30 MHz to 1 GHz	-57	100 KHz
1 GHz to 26 GHz	-47	1 MHz

5.2.1.2 Test Setup

See the section 4.4.1 (Diagram 1) for test setup description.

5.2.1.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.7.2

5.2.1.4 Test Result

Please refer to ANNEX A.7.

5.2.2 Dynamic Frequency Selection (DFS)

5.2.2.1 Limit

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Slave. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables A for the applicability of DFS requirements for each of the operational modes.

Requirement	Operational Mode		
	Master	Slave (without radar detection)	Slave (with radar detection)
Channel Availability Check	Required	Not required	Required (see Note 2)
Off-Channel CAC (see note 1)	Required	Not required	Required (see Note 2)
In-Service Monitoring	Required	Not required	Required
Channel Shutdown	Required	Required	Required
Non-Occupancy Period	Required	Not required	Required
Uniform Spreading	Required	Not required	Not required

Note ¹: Where implemented by the manufacturer.
Note ²: A slave with radar detection is not required to perform a CAC or Off-Channel CAC at initial use of the channel but only after the slave has detected a radar signal on the Operating Channel by In-Service Monitoring and the Non-Occupancy Period resulting from this detection has elapsed.

The radar detection requirements specified in clauses 4.2.6.2.2 to 4.2.6.2.4 assume that the centre frequencies of the radar signals fall within the central 80 % of the Occupied Channel Bandwidth of the RLAN channel.

DFS requirement values

Parameter	Value
Channel Availability Check Time	60 s (see Note 1)
Minimum Off-Channel CAC Time	6 minutes (see Note 2)
Maximum Off-Channel CAC Time	4 hours (see Note 2)
Channel Move Time	10 s
Channel Closing Transmission Time	1 s
Non-Occupancy Period	30 minutes

Note 1: For channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the Channel Availability Check Time shall be 10 minutes.
Note 2: For channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the Off-Channel CAC Time shall be within the range 1 hour to 24 hours.

Interference threshold values

e.i.r.p. Spectral Density (dBm/MHz)	Value (see Note ^{1&2})
10	-62 dBm
Note ¹ : This is the level at the input of the receiver of an RLAN device with a maximum e.i.r.p. density of 10 dBm/MHz and assuming a 0 dBi receive antenna. For devices employing different e.i.r.p. spectral density and/or a different receive antenna gain G (dBi) the DFS threshold level at the receiver input follows the following relationship:	
DFS Detection Threshold (dBm) = -62 + 10 - e.i.r.p. Spectral Density (dBm/MHz) + G (dBi); however the DFS threshold level shall not be less than -64 dBm assuming a 0 dBi receive antenna gain.	
Note ² : Slave devices with a maximum e.i.r.p. of less than 23 dBm do not have to implement radar detection unless these devices are used in fixed outdoor point to point or fixed outdoor point to multipoint applications (see clause 4.2.6.1.3).	

Parameters of the reference DFS test signal

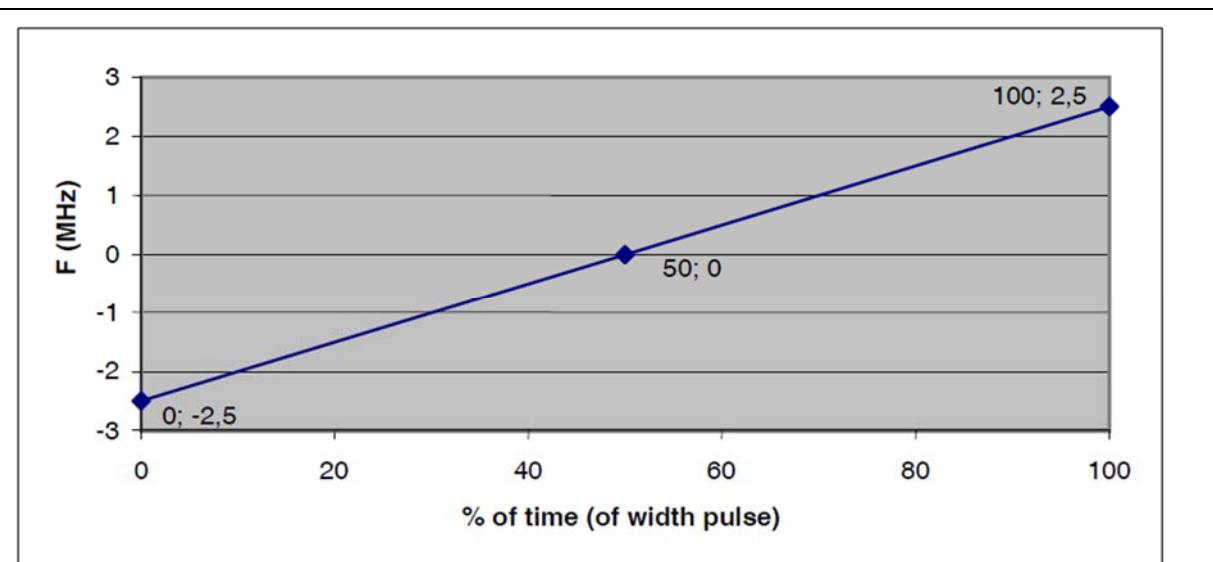
Pulse width W [μs]	Pulse repetition frequency PRF [PPS]	Pulses per burst [PPB]
1	700	18

Parameters of radar test signals

Radar test signal # (see Note ¹ to Note ³)	Pulse width W [μs]		Pulse repetition frequency PRF (PPS)		Number of different PRFs	Pulses per burst for each PRF (PPB) (see Note ⁵)
	Min	Max	Min	Max		
1	0.5	5	200	1000	1	10 (see Note ⁶)
2	0.5	15	200	1600	1	15 (see Note ⁶)
3	0.5	15	2300	4000	1	25
4	20	30	2000	4000	1	20
5	0.5	2	300	400	2/3	10 (see Note ⁶)
6	0.5	2	400	1200	2/3	15 (see Note ⁶)

Note ¹: Radar test signals #1 to #4 are constant PRF based signals. See figure D.1. These radar test signals are intended to simulate also radars using a packet based Staggered PRF. See figure D.2.

Note ²: Radar test signal #4 is a modulated radar test signal. The modulation to be used is a chirp modulation with a ±2,5 MHz frequency deviation which is described below.



Note ³: Radar test signals #5 and #6 are single pulse based Staggered PRF radar test signals using 2 or 3 different PRF values. For radar test signal #5, the difference between the PRF values chosen shall be between 20 PPS and 50 PPS. For radar test signal #6, the difference between the PRF values chosen shall be between 80 PPS and 400 PPS. See figure D.3.

Note ⁴: Apart for the Off-Channel CAC testing, the radar test signals above shall only contain a single burst of pulses. See figure D.1, figure D.3 and figure D.4. For the Off-Channel CAC testing, repetitive bursts shall be used for the total duration of the test.

See figure D.2 and figure D.5. See also clause 4.2.6.2.3, clause 5.4.8.2.1.4.2 and clause 5.4.8.2.1.4.3.

Note ⁵: The total number of pulses in a burst is equal to the number of pulses for a single PRF multiplied by the number of different PRFs used.

Note ⁶: For the CAC and Off-Channel CAC requirements, the minimum number of pulses (for each PRF) for any of the radar test signals to be detected in the band 5 600 MHz to 5 650 MHz shall be 18.

Detection probability

Parameter	Detection Probability (Pd)	
	Channels whose nominal bandwidth falls partly or completely within the 5 600 MHz to 5 650 MHz band	Other channels
CAC, Off-Channel CAC	99,99 %	60 %
In-Service Monitoring	60 %	60 %

NOTE: Pd gives the probability of detection per simulated radar burst and represents a minimum level of detection performance under defined conditions. Therefore Pd does not represent the overall detection probability for any particular radar under real life conditions.

5.2.2.2 Test Setup

See the section 4.4.3 (Diagram 4) for test setup description.

5.2.2.3 Test Procedure

The measured channel shall test with the lowest and highest bandwidth. The radar signal was the same as transmitted channels, and injected into the antenna port of AP (master) with radar signal, measured the channel shutdown. The slave transmitted the test data to master.

Specific test procedure please reference to ETSI EN 301 893 V2.1.1 clause 5.4.8.2

5.2.2.4 Test Result

Please refer to ANNEX A.8.

5.2.3 Adaptivity (Channel Access Mechanism)

5.2.3.1 Priority Classes

Table 8 each contain four different sets of Channel Access parameters for Supervised Devices respectively, resulting in different Priority Classes and different maximum Channel Occupancy Times.

If a Channel Occupancy consists of more than one transmission the transmissions may be separated by gaps. The Channel Occupancy Time is the total duration of all transmissions and all gaps of 25 µs duration or less within a Channel Occupancy and shall not exceed the maximum Channel Occupancy Time in table 8. The duration from the start of the first transmission within a Channel Occupancy until the end of the last transmission in that same Channel Occupancy shall not exceed 20 ms.

Table 8: Priority Class dependent Channel Access parameters for Supervised Devices

Class #	P ₀	CW _{min}	CW _{max}	Maximum Channel Occupancy Time (COT)
4	2	3	7	2 ms
3	2	7	15	4 ms
2	3	15	1 023	6 ms (see note 1)
1	7	15	1 023	6 ms (see note 1)

NOTE 1: The maximum Channel Occupancy Time (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 µs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time.

NOTE 2: The values for p₀, CW_{min}, CW_{max} are minimum values. Greater values are allowed.

5.2.3.2 Limit

This requirement applies to equipment, testing shall be performed using the combination/grouping of 20 MHz operating channels. The manufacturer shall state whether the UUT is capable of operating as a Frame Based Equipment or Load Based Equipment. See tables for the applicability of adaptive requirements and limit for each of the operational modes.

Applicability of adaptive requirements and limit

Requirement	Initiating Device Channel Access Mechanism	
	Frame Based Equipment	Load Based Equipment
Periods	1ms ~ 10ms (see note 1)	1ms ~ 10ms (see note 1)
Maximum Channel Occupancy Time (COT)	(see note 2)	See Table 8
Minimum Idle Period	5 % COT and within 100 μ s	5 % COT and within 100 μ s
Clear Channel Assessment (CCA)	16 μ s	9 μ s < $< 16 \mu$ s
Short Control Signaling	Note 3	Note 3

Note 1: Declared by the manufacturer.
Note 2: Different Priority Classes has different limit, please reference to table 8.
Note 3: Within an observation period of 50 ms, the number of Short Control Signaling Transmissions by the equipment shall be equal to or less than 50ms, the total duration of the equipment's Short Control Signaling Transmissions shall be less than 2 500 μ s within said observation period.

Interference Signals used for Adaptivity Tests

Interference Signals Type	Bandwidth (MHz)	Descriptions
AWGN	20	Note 1
OFDM	20	
LTE	20	
Note 1: All of interference signals shall be a continuous (100 % duty cycle), the OFDM signal as defined in IEEE 802.11™-2016 [9], clause 17 and the LTE-type signal as described in ETSI TS 136 141 [8], clause 6.1.1.1.		

Interference threshold level

	The maximum transmit power (P_H)	Threshold level (TL) (see notes 1)
Option1	--	-75 dBm / MHz
Option2	$P_H \leq 13 \text{ dBm}$	-75 dBm / MHz
	$13 \text{ dBm} < P_H < 23 \text{ dBm}$	$-85 \text{ dBm/MHz} + (23 \text{ dBm} - P_H)$
	$P_H \geq 23 \text{ dBm}$	-85 dBm/MHz
Note 1: The ED Threshold Level (TL), at the input of the receiver, shall be proportional to the maximum transmit power (P_H) according to the formula which assumes a 0 dBi receive antenna and P_H to be specified in dBm e.i.r.p.		

Test Setup

See the section 4.4.4 (Diagram 5) for test setup description.

5.2.3.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.9.2

Set for the interference signal

Step 1:

Test the highest of all Pburst values, (value "A" in dBm) will be used for maximum e.i.r.p. calculations.

Step 2: Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.

If applicable, add the additional beamforming gain "Y" in dB.

If more than one antenna assembly is intended for this power setting ,the maximum overall antenna gain (G or G+Y) shall be used.

The RF Output Power (P) shall be calculated using the formula below:

Pout e.i.r.p = A + G + Y

Step 3: Set the interference signal level according to the maximum transmit power.

5.2.3.4 Test Result

Please refer to ANNEX A.9.

5.2.4 Receiver Blocking

5.2.4.1 Limit

While maintaining the minimum performance criteria as defined in clause 4.2.8.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined in table 9.

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)		Type of blocking signal
		Master or Slave with radar detection (see table D.2, note 2)	Slave without radar detection (see table D.2, note 2)	
Pmin + 6 dB	5100	-53	-59	Continuous Wave
Pmin + 6 dB	4900 5000 5975	-47	-53	Continuous Wave

NOTE 1: Pmin is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined clause 4.2.8.3 in the absence of any blocking signal.
NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.

5.2.4.2 Test Setup

See the section 4.4.5 (Diagram 6) for test setup description.

5.2.4.3 Test Procedure

Reference to ETSI EN 301 893 V2.1.1 clause 5.4.10.2

5.2.4.4 Test Result

Please refer to ANNEX A.10.

5.2.5 User Access Restrictions

5.2.5.1 Definition

User Access Restrictions are restraints implemented in the RLAN to restrict access for the user to certain hardware and/or software settings of the equipment.

5.2.5.2 Requirement

DFS controls (hardware or software) related to radar detection shall not be accessible to the user so that the DFS requirements described in clauses 4.2.6.2.1 to 4.2.6.2.4 can neither be disabled nor altered.

5.2.5.3 Test Result

Note: Not applicable.

5.2.6 Geo-location capability

5.2.6.1 Definition

This requirement only applies to equipment with geo-location capability

Geo-location capability is a feature of the RLAN device to determine its geographical location with the purpose to configure itself according to the regulatory requirements applicable at the geographical location where it operates. The geo-location capability may be present in the equipment or in an external device (temporary) associated with the equipment operating at the same geographical location during the initial power up of the equipment. The geographical location may also be available in equipment already installed and operating at the same geographical location.

5.2.6.2 Requirement

The geographical location determined by the equipment as defined in clause 4.2.10.3 shall not be accessible to the user.

5.2.6.3 Test Result

Note: Not applicable.

ANNEX A TEST RESULT

A.1 Centre frequencies

Measuring Parameter

Centre Frequency	The centre frequency of the channel under test
RBW (MHz)	100 kHz
VBW (MHz)	300 kHz
Span (MHz)	20 MHz (for 20 MHz channel), 40 MHz (for 40 MHz channel) 80MHz (For 80MHz channel)
Detector mode	RMS
Sweep Point	30000
Trace mode	Max Hold
Sweep time	1s
Test Method	<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted

Test Data

Modulation Mode		802.11a			
Sub-band		Low band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5180.100000	19.31	5320.080000	15.04
LT	NV	5180.100320	19.37	5320.079881	15.02
HT	NV	5180.099099	19.13	5320.078529	14.76
Test Verdict		Pass			

Modulation Mode		802.11a			
Sub-band		High band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5500.080000	14.55	5700.100000	17.54
LT	NV	5500.079892	14.53	5700.098020	17.20
HT	NV	5500.082346	14.97	5700.103295	18.12
Test Verdict		Pass			

Modulation Mode		802.11n(20 MHz)			
Sub-band		Low band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5180.100000	19.31	5320.100000	18.80
LT	NV	5180.101959	19.68	5320.103161	19.39
HT	NV	5180.093743	18.10	5320.101108	19.01
Test Verdict		Pass			

Modulation Mode		802.11n(20 MHz)			
Sub-band		High band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5500.080000	14.55	5700.100000	17.54
LT	NV	5500.081384	14.80	5700.098704	17.32
HT	NV	5500.081726	14.86	5700.103358	18.13
Test Verdict		Pass			

Modulation Mode		802.11n(40 MHz)			
Sub-band		Low band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5190.100000	19.27	5310.100000	18.83
LT	NV	5190.095050	18.31	5310.095052	17.90
HT	NV	5190.095528	18.41	5310.094564	17.81
Test Verdict		Pass			

Modulation Mode		802.11n(40 MHz)			
Sub-band		High band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5510.100000	18.15	5670.100000	17.64
LT	NV	5510.105155	19.08	5670.098920	17.45
HT	NV	5510.098663	17.91	5670.105225	18.56
Test Verdict		Pass			

Modulation Mode		802.11ac(20 MHz)			
Sub-band		Low band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5180.100000	19.31	5320.100000	18.80
LT	NV	5180.098195	18.96	5320.098596	18.53
HT	NV	5180.099774	19.26	5320.099784	18.76
Test Verdict		Pass			

Modulation Mode		802.11ac(20 MHz)			
Sub-band		High band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5500.100000	18.18	5700.100000	17.54
LT	NV	5500.098655	17.94	5700.097042	17.02
HT	NV	5500.104311	18.97	5700.097090	17.03
Test Verdict		Pass			

Modulation Mode		802.11ac(40 MHz)			
Sub-band		Low band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5190.100000	19.27	5310.100000	18.83
LT	NV	5190.103406	19.92	5310.099499	18.74
HT	NV	5190.103604	19.96	5310.097443	18.35
Test Verdict		Pass			

Modulation Mode		802.11ac(40 MHz)			
Sub-band		High band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5510.100000	18.15	5670.100000	17.64
LT	NV	5510.104288	18.93	5670.098811	17.43
HT	NV	5510.097893	17.77	5670.098312	17.34
Test Verdict		Pass			

Modulation Mode		802.11ac(80 MHz)			
Sub-band		Low band			
Limit		±20 ppm			
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5210.100000	19.19	5290.100000	18.90
LT	NV	5210.099798	19.16	5290.098892	18.69
HT	NV	5210.103265	19.82	5290.100293	18.96
Test Verdict		Pass			

Modulation Mode	802.11ac(80 MHz)				
Sub-band	High band				
Limit	± 20 ppm				
Test Result					
Test Conditions		Carrier Centre Frequencies f_c (MHz)			
Temperature	Voltage	Low Channel		High Channel	
		Frequency (MHz)	ppm	Frequency (MHz)	ppm
NT	NV	5530.100000	18.08	5610.100000	17.83
LT	NV	5530.097392	17.61	5610.105359	18.78
HT	NV	5530.104074	18.82	5610.106266	18.94
Test Verdict		Pass			

A.2 Nominal Channel Bandwidth and Occupied Channel Bandwidth

Measuring Parameter

Centre Frequency	The centre frequency of the channel under test
RBW (MHz)	100 kHz
VBW (MHz)	300 kHz
Span (MHz)	40 MHz (for 20 MHz channel), 80 MHz (for 40 MHz channel) 160MHz (for 80 MHz channel)
Detector mode	RMS
Trace mode	Max Hold
Sweep time	2s
Test Method	<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted

Test Data

Modulation Mode	802.11a				
Limit	16~20 MHz				
Test Result					
Test Conditions	Occupied Bandwidth (MHz)				
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	16.423229	16.434218	16.420973	16.419397
Test Verdict	Pass				

Modulation Mode	802.11n(20MHz)				
Limit	16~20 MHz				
Test Result					
Test Conditions	Occupied Bandwidth (MHz)				
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	17.604899	17.603754	17.606714	17.596137
Test Verdict	Pass				

Modulation Mode	802.11n(40MHz)				
Limit	32~40 MHz				
Test Result					
Test Conditions	Occupied Bandwidth (MHz)				
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	36.159983	36.147736	36.155468	36.154028
Test Verdict	Pass				

Modulation Mode		802.11ac(20MHz)			
Limit		16~20 MHz			
Test Result					
Test Conditions		Occupied Bandwidth (MHz)			
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	17.612737	17.593238	17.591688	17.611837
Test Verdict		Pass			

Modulation Mode		802.11ac(40MHz)			
Limit		32~40 MHz			
Test Result					
Test Conditions		Occupied Bandwidth (MHz)			
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	36.166785	36.153383	36.143463	36.153046
Test Verdict		Pass			

Modulation Mode		802.11ac(80MHz)			
Limit		64~80 MHz			
Test Result					
Test Conditions		Occupied Bandwidth (MHz)			
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	75.527184	75.511166	75.540625	75.537830
Test Verdict		Pass			

A.3 RF output power

Test Data

Note ¹: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.

Note ²: Slave devices without a Radar interface Detection function shall comply with the limits for the frequency range 5250-5350.

Modulation Mode			802.11a			
Limit	Low Sub-band		20/23 dBm <small>Note 1</small>			
	High Sub-band		27/30 dBm <small>Note 2</small>			
Test Result						
Test Method	Test Conditions		EIRP (dBm)			
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	Temperature	Voltage	Low Sub-band		High Sub-band	
			Low Channel	High Channel	Low Channel	High Channel
	NT	NV	12.5	12.9	14.5	16.6
	LT	NV	12.6	12.7	14.5	16.7
	HT	NV	12.7	12.7	14.7	16.4
Test Verdict			Pass			

Modulation Mode			802.11n(20 MHz)			
Limit	Low Sub-band		20/23 dBm <small>Note 1</small>			
	High Sub-band		27/30 dBm <small>Note 2</small>			
Test Result						
Test Method	Test Conditions		EIRP (dBm)			
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	Temperature	Voltage	Low Sub-band		High Sub-band	
			Low Channel	High Channel	Low Channel	High Channel
	NT	NV	13.0	13.8	14.8	16.3
	LT	NV	13.0	14.0	14.5	16.5
	HT	NV	12.7	14.0	14.4	16.3
Test Verdict			Pass			

Modulation Mode			802.11n(40 MHz)			
Limit	Low Sub-band		20/23 dBm <small>Note 1</small>			
	High Sub-band		27/30 dBm <small>Note 2</small>			
Test Result						
Test Method	Test Conditions		EIRP (dBm)			
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	Temperature	Voltage	Low Sub-band		High Sub-band	
			Low Channel	High Channel	Low Channel	High Channel
	NT	NV	12.2	13.0	14.0	15.4
	LT	NV	11.8	13.2	13.7	15.5
	HT	NV	12.0	12.8	13.7	15.2
Test Verdict			Pass			

Modulation Mode			802.11ac(20 MHz)			
Limit	Low Sub-band		20/23 dBm <small>Note 1</small>			
	High Sub-band		27/30 dBm <small>Note 2</small>			
Test Result						
Test Method	Test Conditions		EIRP (dBm)			
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	Temperature	Voltage	Low Sub-band		High Sub-band	
			Low Channel	High Channel	Low Channel	High Channel
	NT	NV	13.9	14.3	15.9	16.2
	LT	NV	13.7	14.1	15.7	16.0
	HT	NV	13.6	14.1	15.7	15.8
Test Verdict			Pass			

Modulation Mode			802.11ac(40 MHz)			
Limit	Low Sub-band		20/23 dBm <small>Note 1</small>			
	High Sub-band		27/30 dBm <small>Note 2</small>			
Test Result						
Test Method	Test Conditions		EIRP (dBm)			
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	Temperature	Voltage	Low Sub-band		High Sub-band	
			Low Channel	High Channel	Low Channel	High Channel
	NT	NV	11.8	12.8	13.5	15.0
	LT	NV	11.8	12.4	13.1	14.9
	HT	NV	11.8	12.9	13.4	14.7
Test Verdict			Pass			

Modulation Mode			802.11ac(80 MHz)			
Limit	Low Sub-band		20/23 dBm <small>Note 1</small>			
	High Sub-band		27/30 dBm <small>Note 2</small>			
Test Result						
Test Method	Test Conditions		EIRP (dBm)			
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	Temperature	Voltage	Low Sub-band		High Sub-band	
			Low Channel	High Channel	Low Channel	High Channel
	NT	NV	12.0	12.5	13.5	14.0
	LT	NV	11.8	12.1	13.6	14.2
	HT	NV	11.7	12.6	13.5	13.8
Test Verdict			Pass			

A.4 Power density

Measuring Parameter

RBW (MHz)	1 MHz
VBW (MHz)	3 MHz
Sweep points	26000
Detector mode	RMS
Span (MHz)	40 MHz (for 20 MHz channel), 80 MHz (for 40 MHz channel) 160MHz (for 80 MHz channel)
Trace mode	Max Hold
Sweep time	100s
Test Method	<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted

Test Data

Note ¹: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.

Note ²: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

Modulation Mode		802.11a					
Limit	Low Sub-band	7/10 dBm/MHz <small>Note 1</small>					
	High Sub-band	14/17 dBm/MHz <small>Note 2</small>					
Test Result							
Test Conditions		Power density (dBm/MHz)					
Temperature	Voltage	Low Sub-band			High Sub-band		
		Low Channel	High Channel	Low Channel	High Channel	Low Channel	High Channel
NT	NV	1.1	1.4	4.6	6.8		
Test Verdict		Pass					

Modulation Mode		802.11n(20 MHz)					
Limit	Low Sub-band	7/10 dBm/MHz <small>Note 1</small>					
	High Sub-band	14/17 dBm/MHz <small>Note 2</small>					
Test Result							
Test Conditions		Power density (dBm/MHz)					
Temperature	Voltage	Low Sub-band			High Sub-band		
		Low Channel	High Channel	Low Channel	High Channel	Low Channel	High Channel
NT	NV	1.3	2.0	4.7	6.2		
Test Verdict		Pass					

Modulation Mode		802.11n(40 MHz)			
Limit	Low Sub-band	7/10 dBm/MHz <small>Note 1</small>			
	High Sub-band	14/17 dBm/MHz <small>Note 2</small>			
Test Result					
Test Conditions		Power density (dBm/MHz)			
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	-2.2	-1.8	0.9	2.2
Test Verdict		Pass			

Modulation Mode		802.11ac(20 MHz)			
Limit	Low Sub-band	7/10 dBm/MHz <small>Note 1</small>			
	High Sub-band	14/17 dBm/MHz <small>Note 2</small>			
Test Result					
Test Conditions		Power density (dBm/MHz)			
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	2.2	2.5	5.9	6.1
Test Verdict		Pass			

Modulation Mode		802.11ac(40 MHz)			
Limit	Low Sub-band	7/10 dBm/MHz <small>Note 1</small>			
	High Sub-band	14/17 dBm/MHz <small>Note 2</small>			
Test Result					
Test Conditions		Power density (dBm/MHz)			
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	-2.7	-1.8	0.4	1.8
Test Verdict		Pass			

Modulation Mode		802.11ac(80 MHz)			
Limit	Low Sub-band	7/10 dBm/MHz <small>Note 1</small>			
	High Sub-band	14/17 dBm/MHz <small>Note 2</small>			
Test Result					
Test Conditions		Power density (dBm/MHz)			
Temperature	Voltage	Low Sub-band		High Sub-band	
		Low Channel	High Channel	Low Channel	High Channel
NT	NV	-4.0	-3.8	-1.2	-0.9
Test Verdict		Pass			

A.5 Transmitter unwanted emissions outside the 5 GHz RLAN bands

Note ¹: The test method choose the conducted method. Which power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment (cabinet radiation).

Note ²: The Frequency band was pre-scanned, the harmonic and other spurious which worst frequency are recorded in the report.

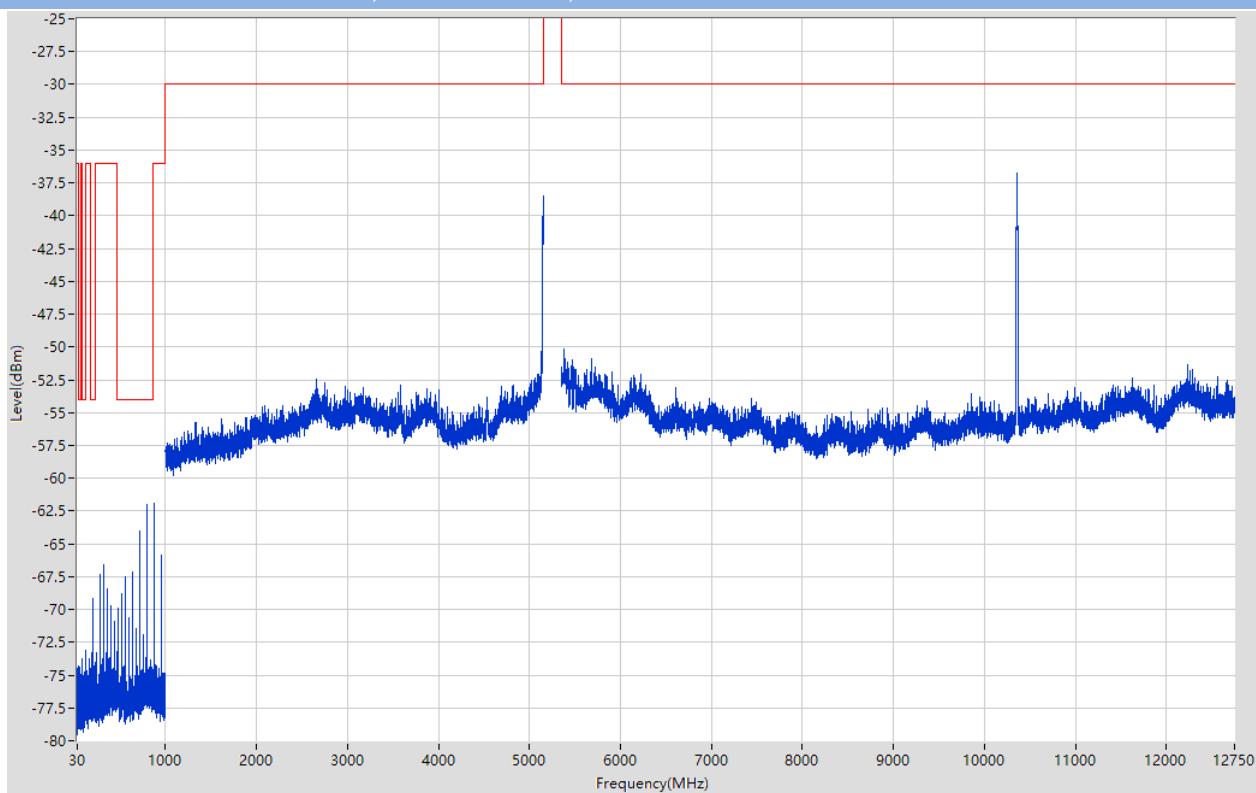
Measuring Parameter

Frequency Range	RBW	100 kHz
30 MHz to 1 000 MHz	VBW	300 kHz
	Sweep points	9700
	Detector mode	Peak
	Trace mode	Max Hold
	RBW	1 MHz
1 GHz to 26 GHz	VBW	3 MHz
	Sweep points	25000
	Detector mode	Peak
	Trace mode	Max Hold

Note: The spurious above 12.75G is noise only, do not show on the report.

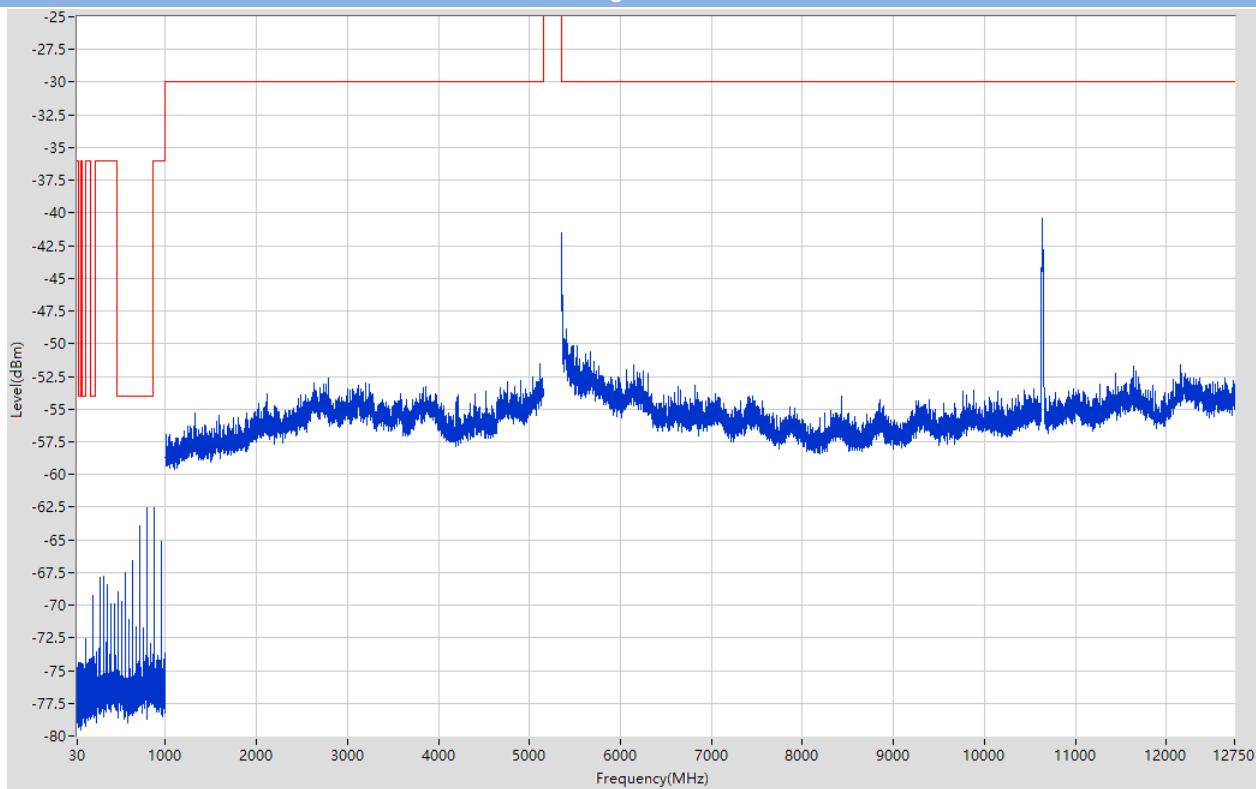
Conducted Test Data

802.11a 30 MHz to 12.75 GHz, Low Sub-band, Low channel



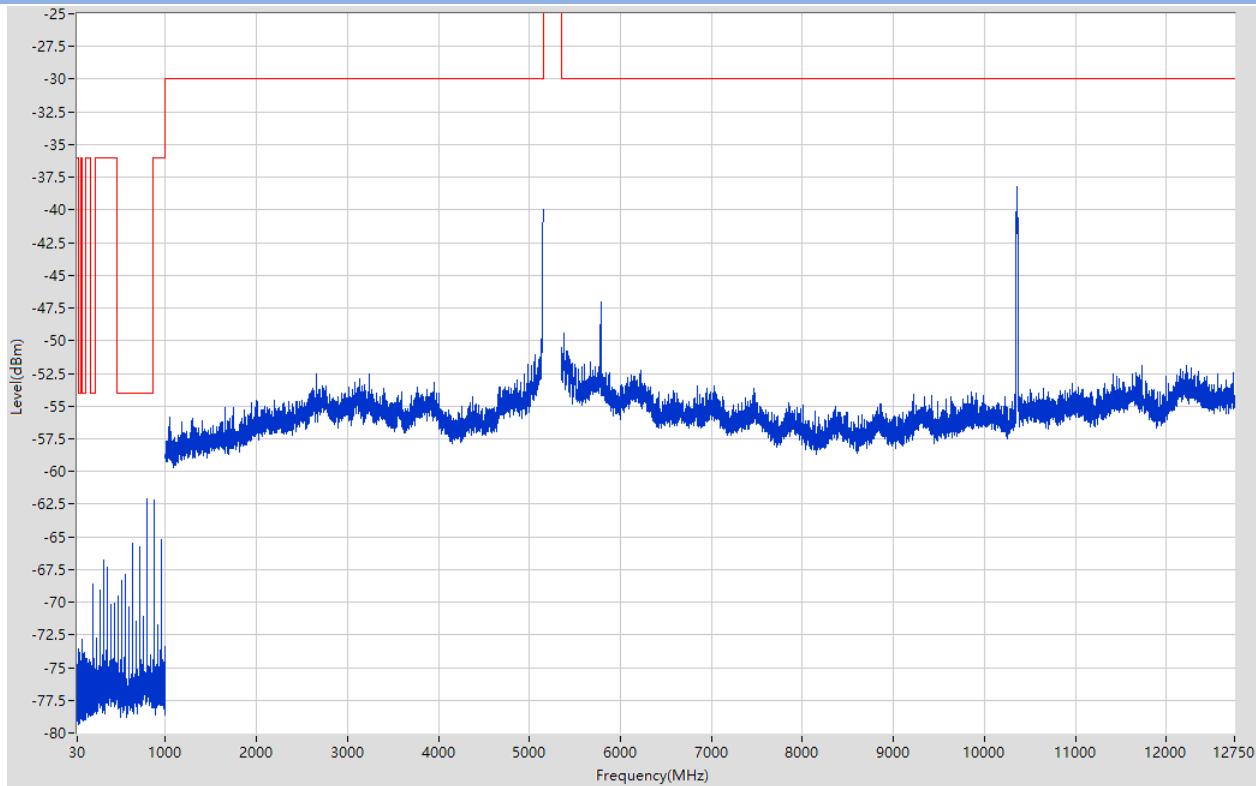
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	39.492	-74.27	-36	Pass	601
47	74	0.1	Peak	60.815	-74.38	-54	Pass	601
74	87.5	0.1	Peak	86.308	-73.76	-36	Pass	601
87.5	118	0.1	Peak	116.78	-74.08	-54	Pass	601
118	174	0.1	Peak	120.053	-73.16	-36	Pass	601
174	230	0.1	Peak	200.04	-69.18	-54	Pass	601
230	470	0.1	Peak	320	-66.55	-36	Pass	601
470	862	0.1	Peak	799.933	-61.98	-54	Pass	601
862	1000	0.1	Peak	879.94	-61.91	-36	Pass	601
1000	5149.5	1	Peak	5149.5	-38.46	-30	Pass	4150
5350.5	12750	1	Peak	10361.839	-36.77	-30	Pass	7400

802.11a 30 MHz to 12.75 GHz, Low Sub-band, High channel



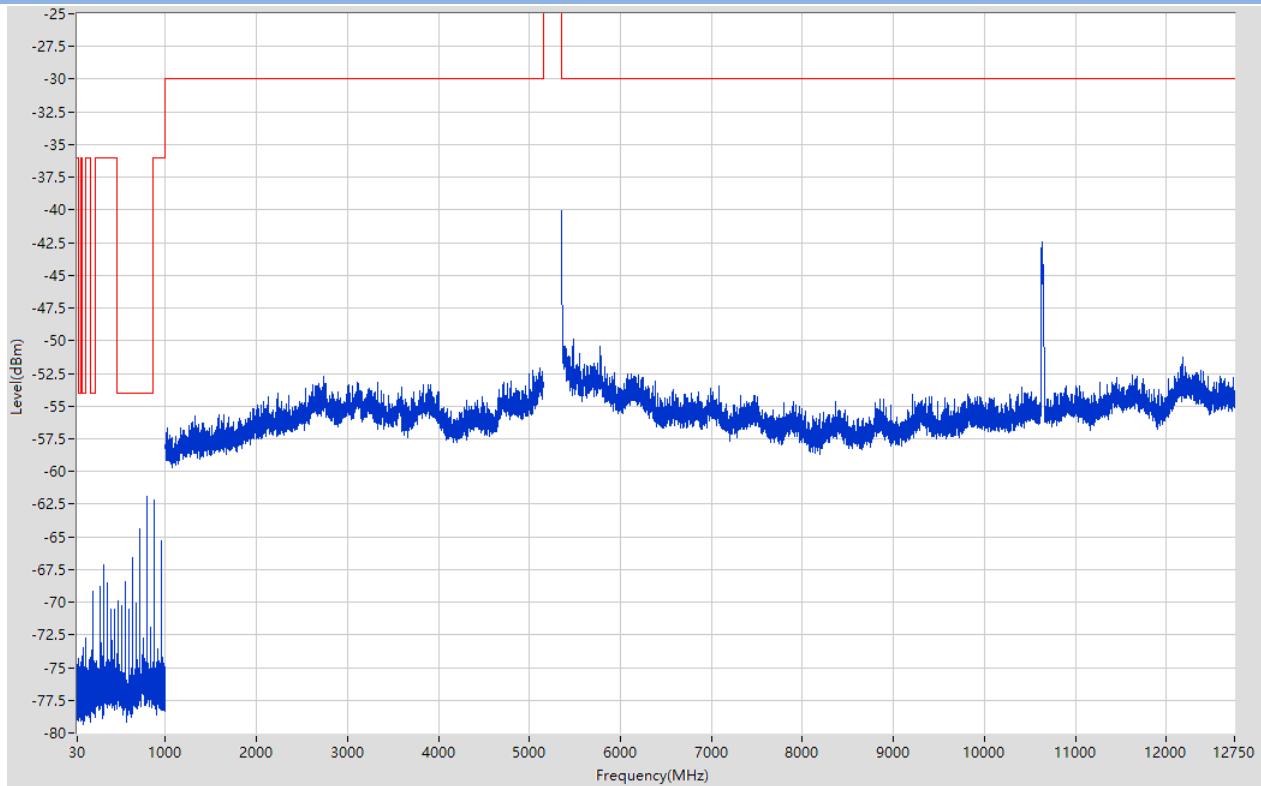
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	46.773	-74.48	-36	Pass	601
47	74	0.1	Peak	67.25	-74.36	-54	Pass	601
74	87.5	0.1	Peak	80.548	-74.48	-36	Pass	601
87.5	118	0.1	Peak	117.848	-74.42	-54	Pass	601
118	174	0.1	Peak	120.053	-72.61	-36	Pass	601
174	230	0.1	Peak	200.04	-69.27	-54	Pass	601
230	470	0.1	Peak	320	-67.83	-36	Pass	601
470	862	0.1	Peak	799.933	-62.59	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.52	-36	Pass	601
1000	5149.5	1	Peak	5112.496	-51.54	-30	Pass	4150
5350.5	12750	1	Peak	10639.857	-40.39	-30	Pass	7400

802.11n20 30 MHz to 12.75 GHz, Low Sub-band, Low channel



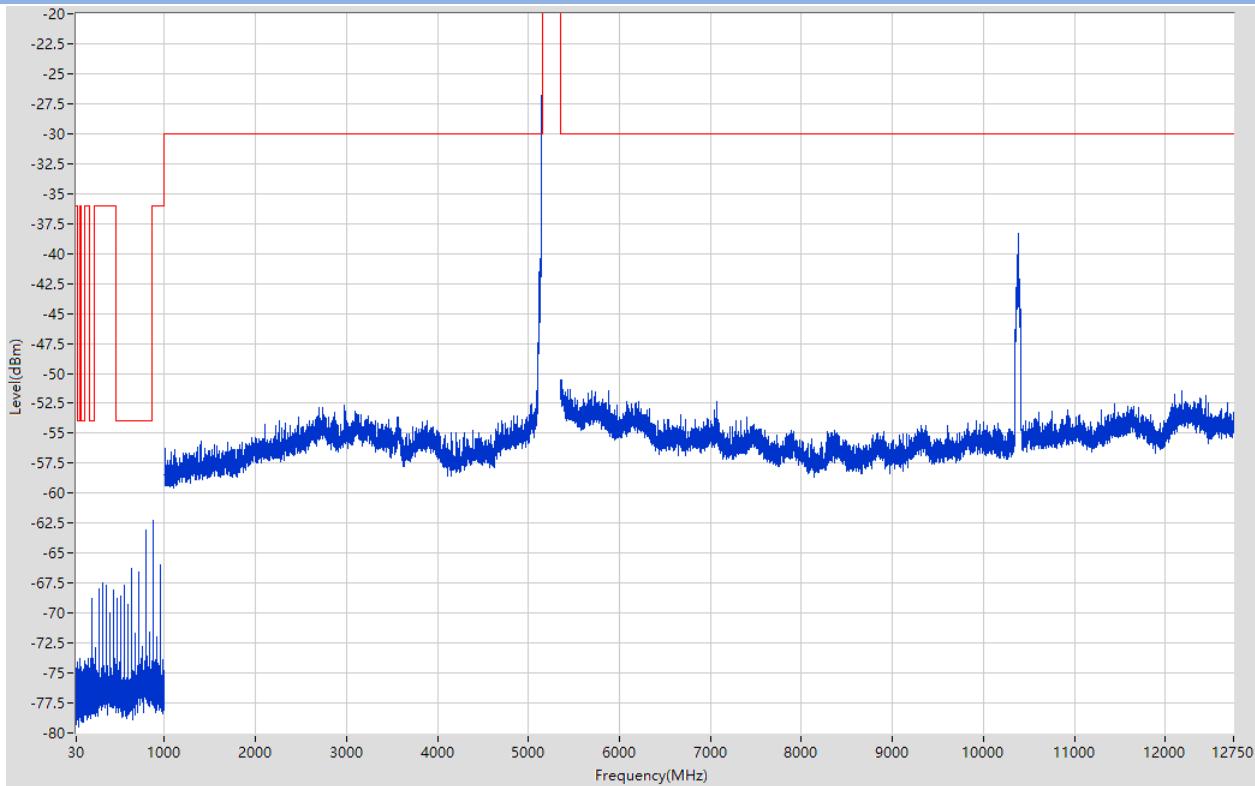
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	43.798	-73.61	-36	Pass	601
47	74	0.1	Peak	50.735	-73.84	-54	Pass	601
74	87.5	0.1	Peak	87.433	-72.84	-36	Pass	601
87.5	118	0.1	Peak	103.665	-73.84	-54	Pass	601
118	174	0.1	Peak	138.253	-74.33	-36	Pass	601
174	230	0.1	Peak	200.04	-68.58	-54	Pass	601
230	470	0.1	Peak	320	-66.81	-36	Pass	601
470	862	0.1	Peak	799.933	-62.13	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.21	-36	Pass	601
1000	5149.5	1	Peak	5148.5	-39.97	-30	Pass	4150
5350.5	12750	1	Peak	10359.838	-38.22	-30	Pass	7400

802.11n20 30 MHz to 12.75 GHz, Low Sub-band, High channel



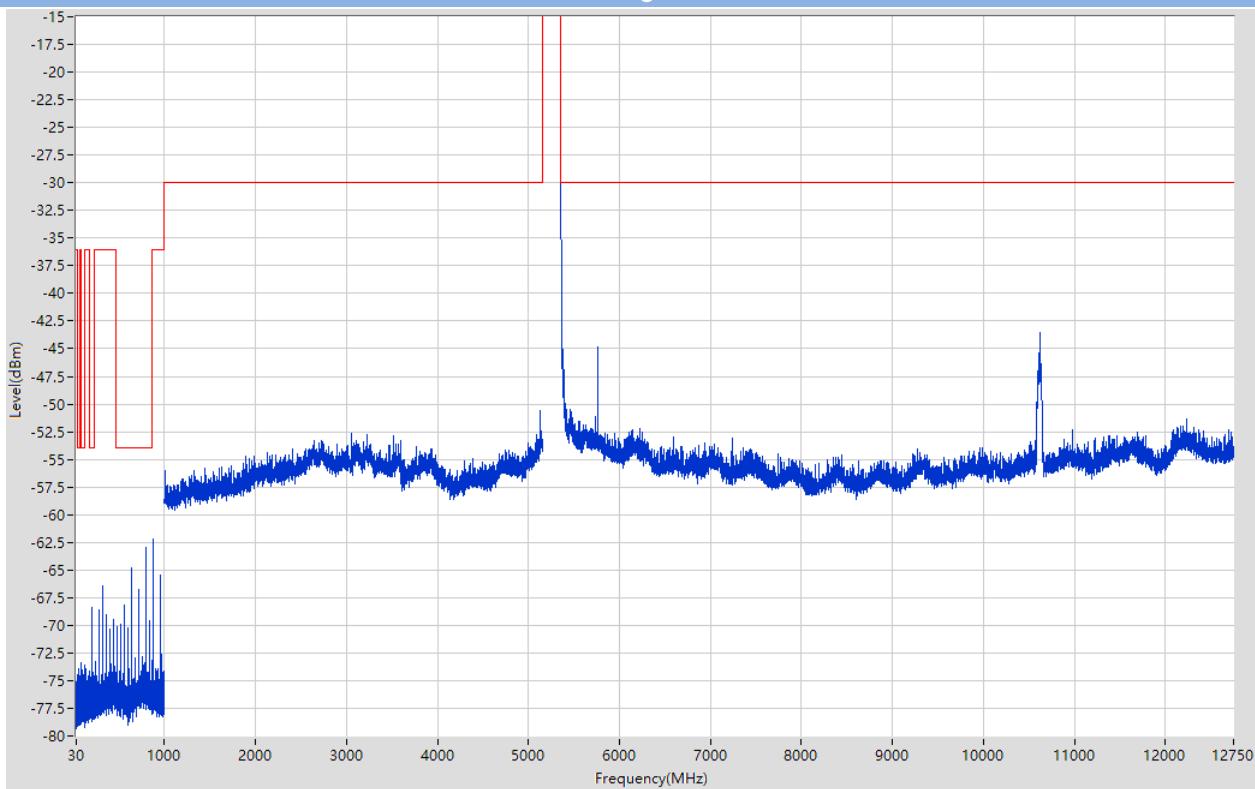
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	46.178	-74.31	-36	Pass	601
47	74	0.1	Peak	68.015	-74.91	-54	Pass	601
74	87.5	0.1	Peak	82.888	-74.12	-36	Pass	601
87.5	118	0.1	Peak	96.091	-73.51	-54	Pass	601
118	174	0.1	Peak	119.96	-72.79	-36	Pass	601
174	230	0.1	Peak	199.947	-69.13	-54	Pass	601
230	470	0.1	Peak	320	-67.18	-36	Pass	601
470	862	0.1	Peak	799.933	-61.93	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.15	-36	Pass	601
1000	5149.5	1	Peak	5117.496	-52.09	-30	Pass	4150
5350.5	12750	1	Peak	5351.5	-40.02	-30	Pass	7400

802.11n40 30 MHz to 12.75 GHz, Low Sub-band, Low channel



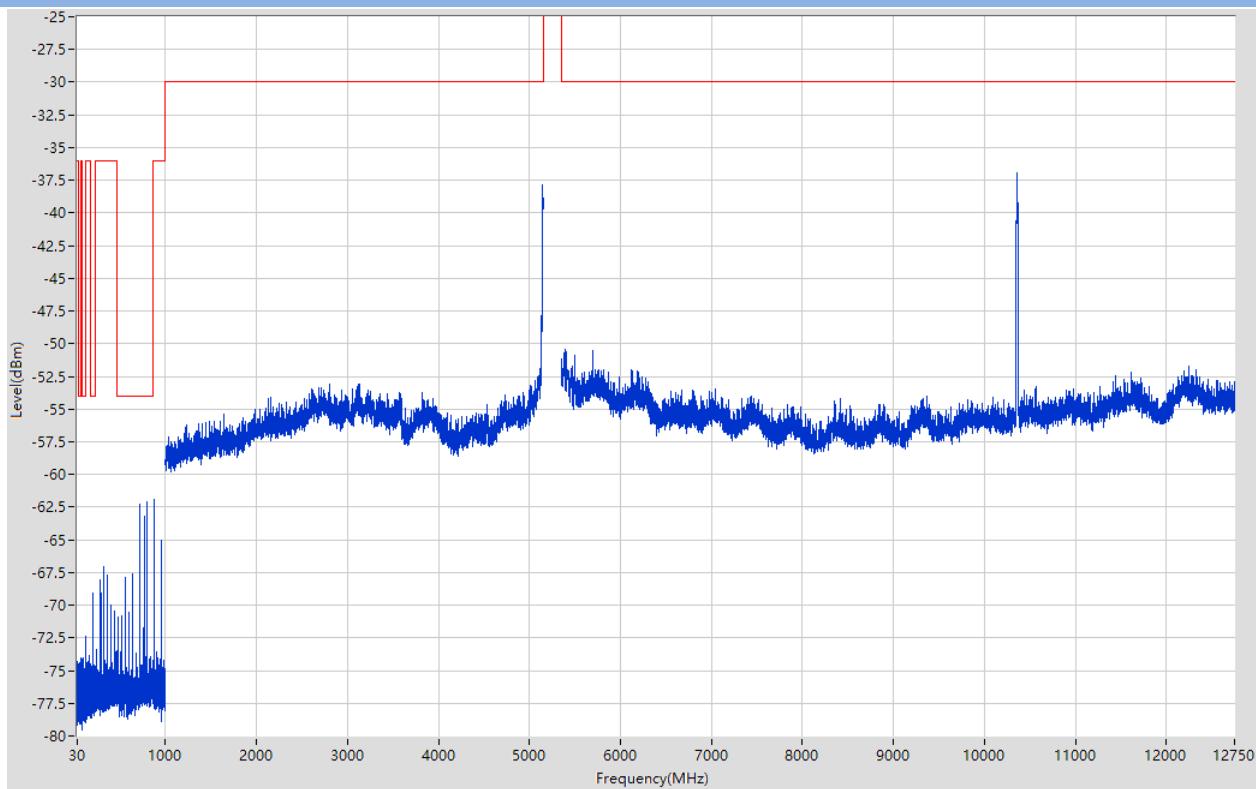
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	37.055	-74.13	-36	Pass	601
47	74	0.1	Peak	70.985	-73.78	-54	Pass	601
74	87.5	0.1	Peak	86.105	-74.47	-36	Pass	601
87.5	118	0.1	Peak	109.358	-74.73	-54	Pass	601
118	174	0.1	Peak	158.6	-73.83	-36	Pass	601
174	230	0.1	Peak	200.04	-68.81	-54	Pass	601
230	470	0.1	Peak	320	-67.49	-36	Pass	601
470	862	0.1	Peak	799.933	-63.11	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.22	-36	Pass	601
1000	5149.5	1	Peak	5146.5	-26.76	-30	N/A	4150
			RMS		-41.67		Pass	30000
5350.5	12750	1	Peak	10379.84	-38.3	-30	Pass	7400

802.11n40 30 MHz to 12.75 GHz, Low Sub-band, High channel



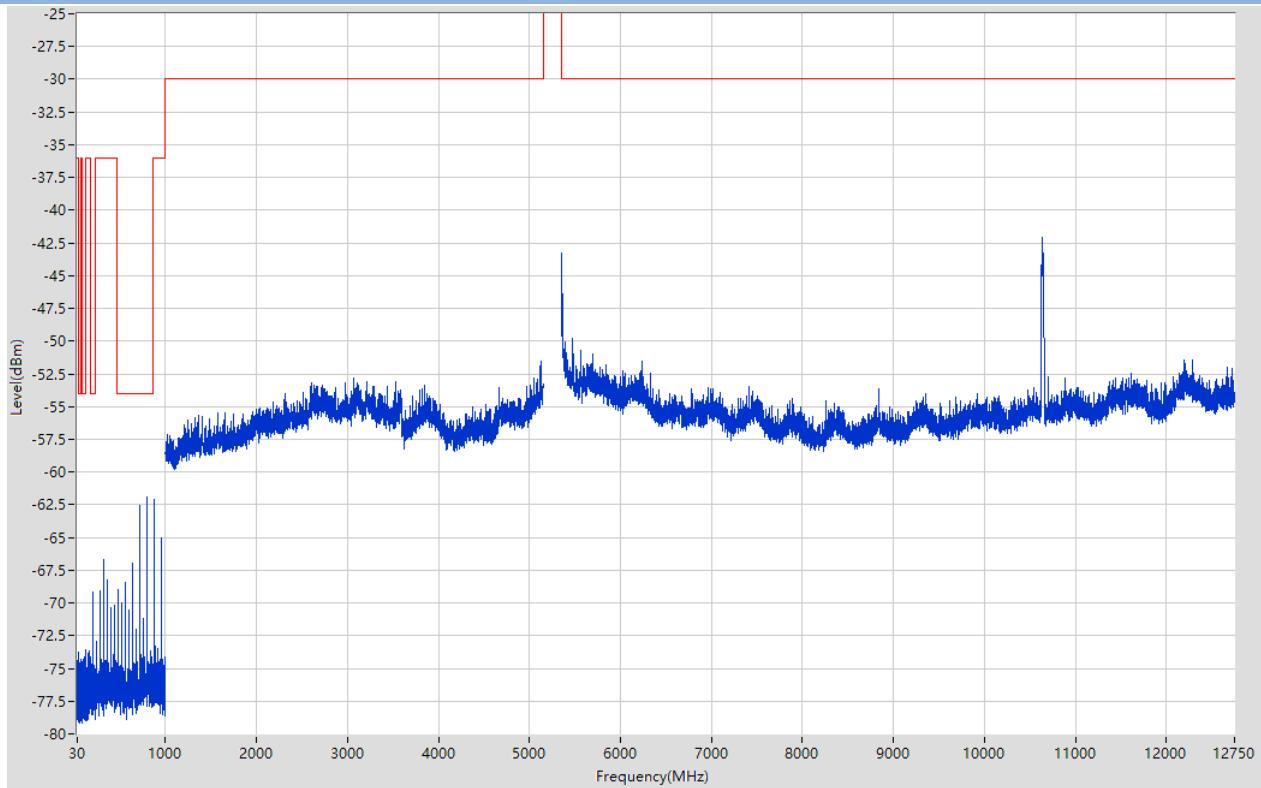
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	43.572	-74.46	-36	Pass	601
47	74	0.1	Peak	61.04	-73.95	-54	Pass	601
74	87.5	0.1	Peak	82.528	-73.37	-36	Pass	601
87.5	118	0.1	Peak	91.973	-74.07	-54	Pass	601
118	174	0.1	Peak	119.96	-73.64	-36	Pass	601
174	230	0.1	Peak	200.04	-68.34	-54	Pass	601
230	470	0.1	Peak	320	-66.38	-36	Pass	601
470	862	0.1	Peak	799.933	-62.99	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.18	-36	Pass	601
1000	5149.5	1	Peak	5127.497	-50.55	-30	Pass	4150
5350.5	12750	1	Peak	5350.5	-23.45	-30	N/A	7400
			RMS		-38.59		Pass	30000

802.11ac20 30 MHz to 12.75 GHz, Low Sub-band, Low channel



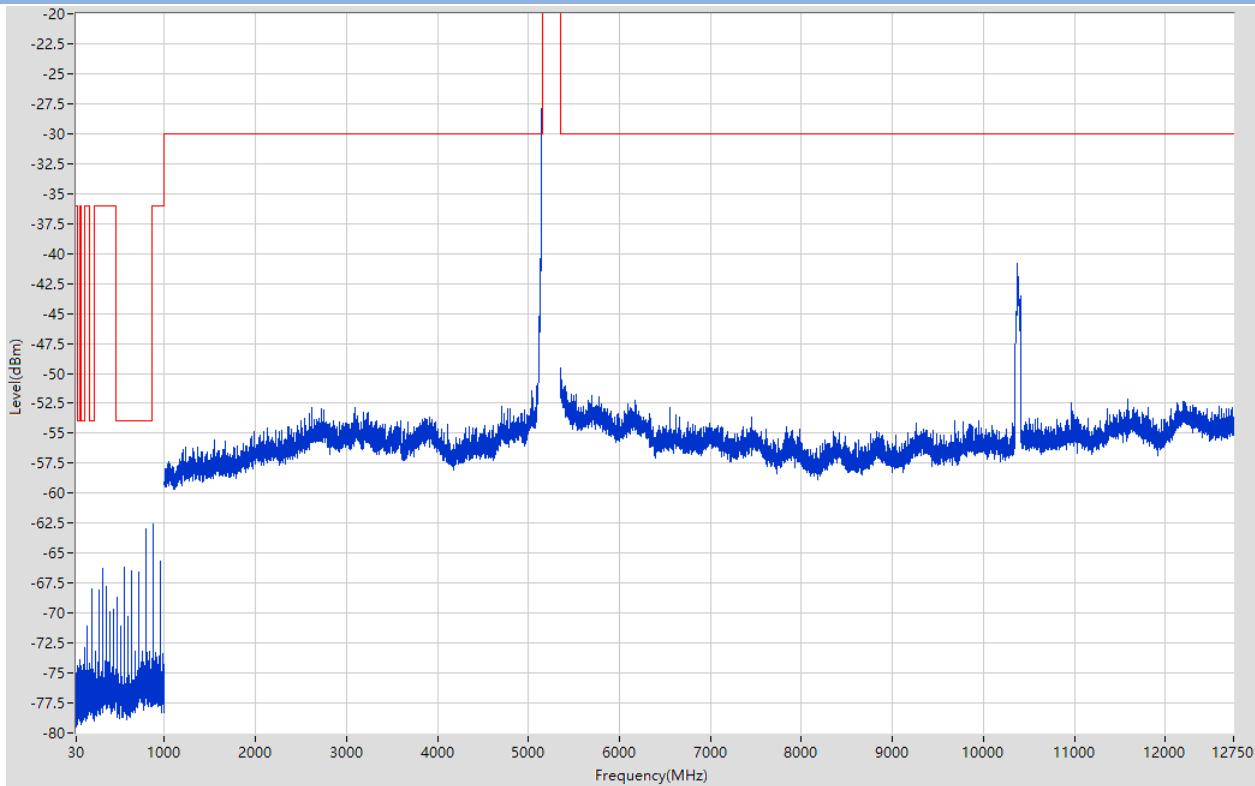
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	31.87	-74.33	-36	Pass	601
47	74	0.1	Peak	67.16	-74.03	-54	Pass	601
74	87.5	0.1	Peak	78.635	-74.13	-36	Pass	601
87.5	118	0.1	Peak	94.82	-73.99	-54	Pass	601
118	174	0.1	Peak	119.96	-72.39	-36	Pass	601
174	230	0.1	Peak	200.04	-69.05	-54	Pass	601
230	470	0.1	Peak	320	-67.01	-36	Pass	601
470	862	0.1	Peak	799.933	-62.11	-54	Pass	601
862	1000	0.1	Peak	879.94	-61.93	-36	Pass	601
1000	5149.5	1	Peak	5146.5	-37.86	-30	Pass	4150
5350.5	12750	1	Peak	10357.838	-36.96	-30	Pass	7400

802.11ac20 30 MHz to 12.75 GHz, Low Sub-band, High channel



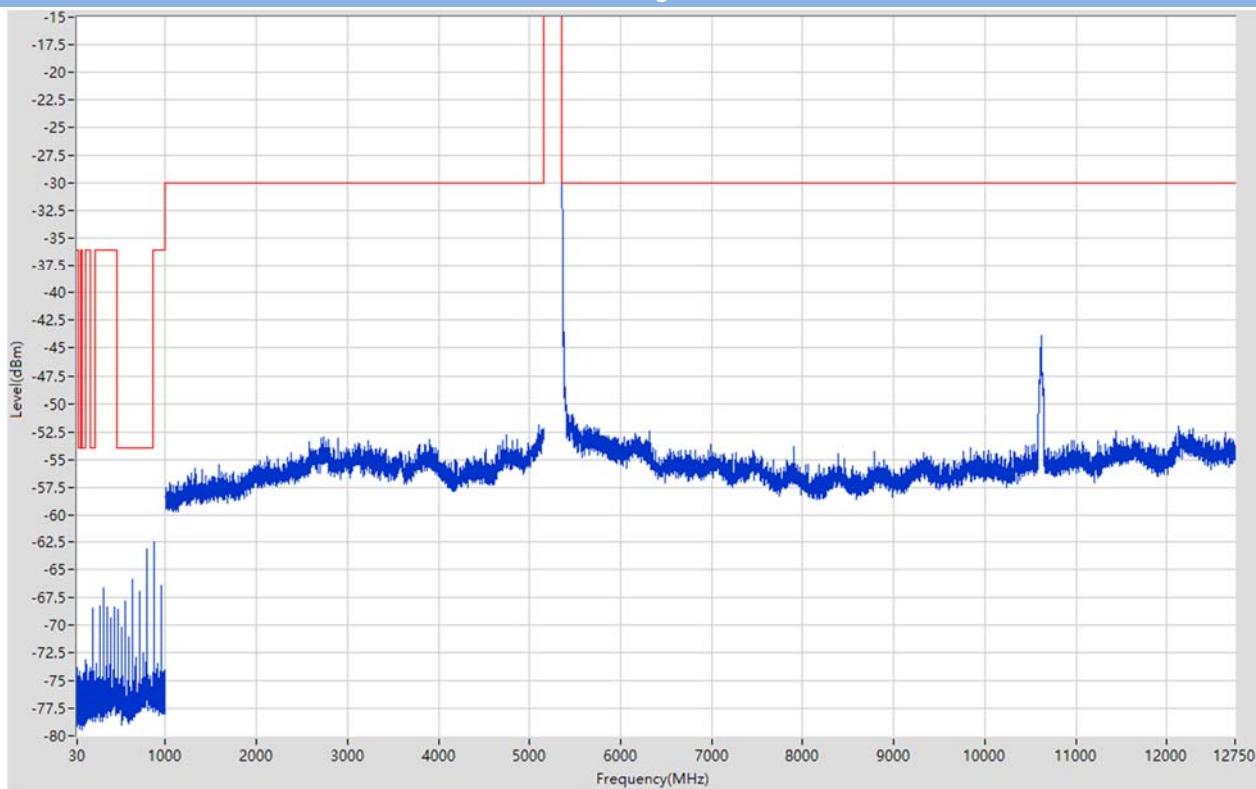
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	44.648	-73.77	-36	Pass	601
47	74	0.1	Peak	65.225	-74.32	-54	Pass	601
74	87.5	0.1	Peak	81.515	-74.53	-36	Pass	601
87.5	118	0.1	Peak	106.766	-74.1	-54	Pass	601
118	174	0.1	Peak	119.96	-73.61	-36	Pass	601
174	230	0.1	Peak	200.04	-69.16	-54	Pass	601
230	470	0.1	Peak	320	-66.7	-36	Pass	601
470	862	0.1	Peak	799.933	-61.88	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.11	-36	Pass	601
1000	5149.5	1	Peak	5128.497	-51.52	-30	Pass	4150
5350.5	12750	1	Peak	10639.857	-42.08	-30	Pass	7400

802.11ac40 30 MHz to 12.75 GHz, Low Sub-band, Low channel



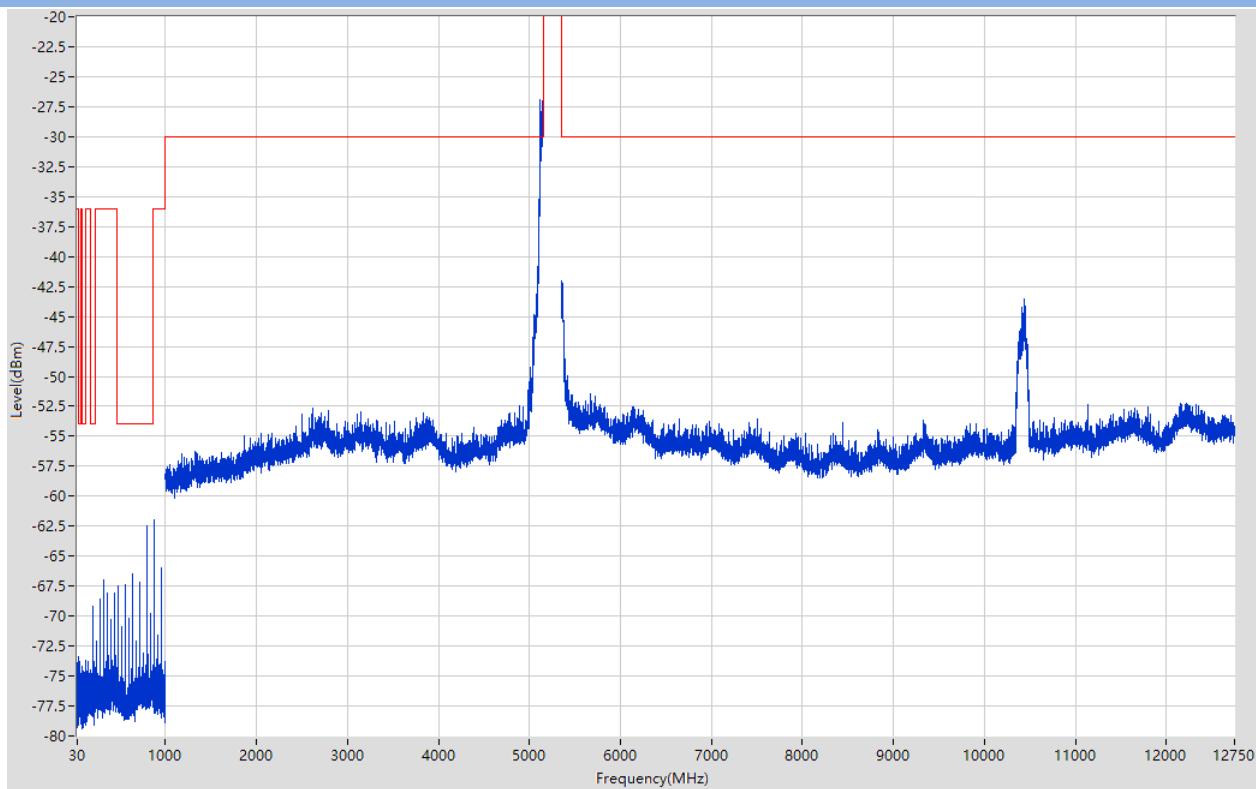
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	38.132	-74.4	-36	Pass	601
47	74	0.1	Peak	71.3	-73.84	-54	Pass	601
74	87.5	0.1	Peak	78.748	-74.36	-36	Pass	601
87.5	118	0.1	Peak	111.493	-74.27	-54	Pass	601
118	174	0.1	Peak	143.947	-71.09	-36	Pass	601
174	230	0.1	Peak	200.04	-67.94	-54	Pass	601
230	470	0.1	Peak	320	-66.33	-36	Pass	601
470	862	0.1	Peak	799.933	-62.92	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.61	-36	Pass	601
1000	5149.5	1	Peak	5149.5	-27.7	-30	N/A	4150
			RMS		-39.42		Pass	30000
5350.5	12750	1	Peak	10378.84	-40.85	-30	Pass	7400

802.11ac40 30 MHz to 12.75 GHz, Low Sub-band, High channel



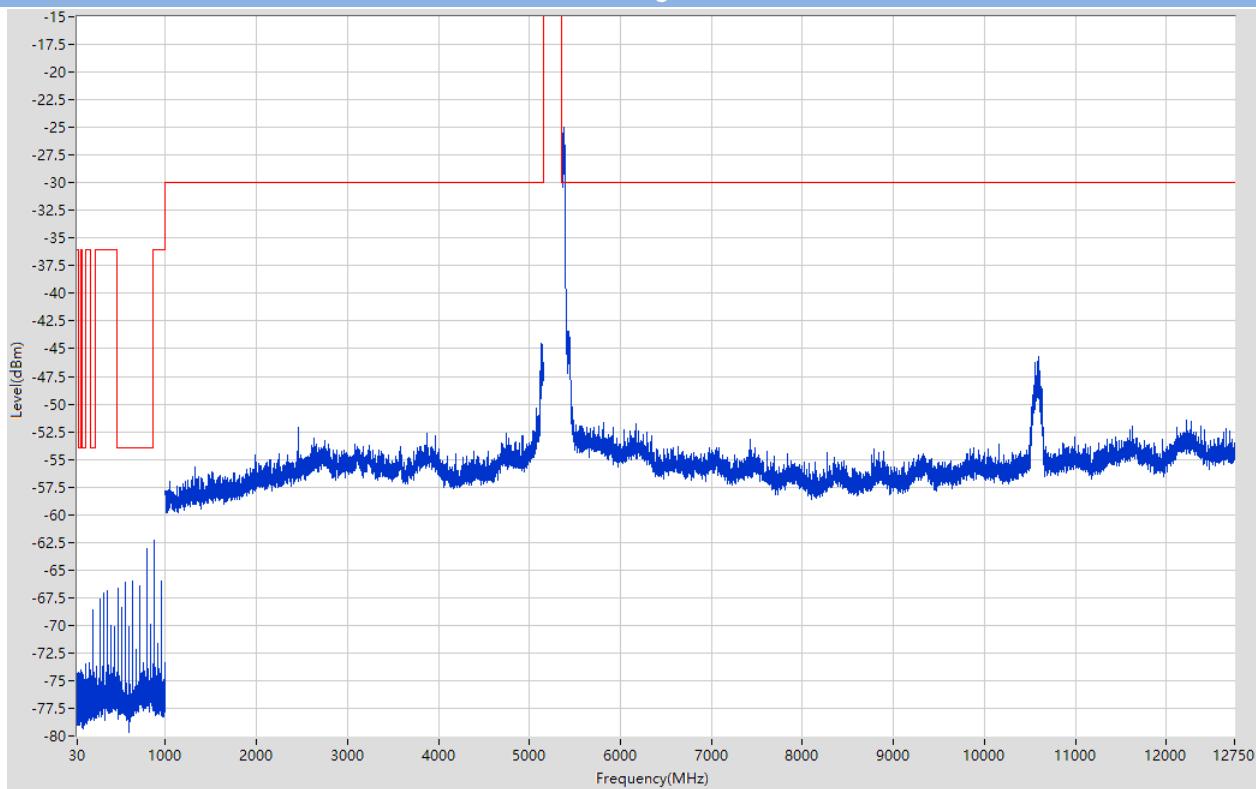
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	35.015	-73.79	-36	Pass	601
47	74	0.1	Peak	54.11	-74.15	-54	Pass	601
74	87.5	0.1	Peak	74.113	-74.7	-36	Pass	601
87.5	118	0.1	Peak	104.123	-74.25	-54	Pass	601
118	174	0.1	Peak	119.96	-73.21	-36	Pass	601
174	230	0.1	Peak	199.947	-68.54	-54	Pass	601
230	470	0.1	Peak	320	-66.63	-36	Pass	601
470	862	0.1	Peak	799.933	-63.22	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.56	-36	Pass	601
1000	5149.5	1	Peak	5108.495	-51.89	-30	Pass	4150
5350.5	12750	1	Peak	5351.5	-23.37	-30	N/A	7400
			RMS		-38.33		Pass	30000

802.11ac80 30 MHz to 12.75 GHz, Low Sub-band, Low channel



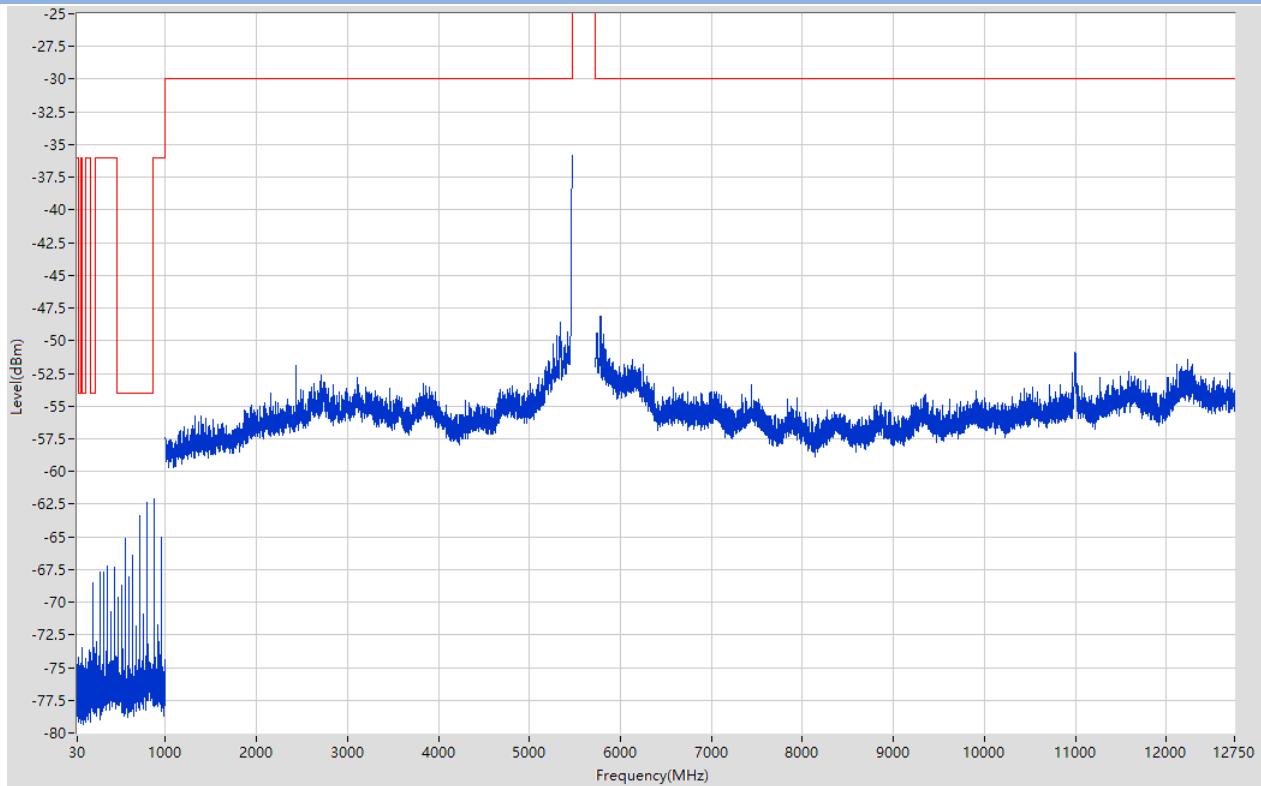
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	34.618	-73.88	-36	Pass	601
47	74	0.1	Peak	47.945	-73.4	-54	Pass	601
74	87.5	0.1	Peak	80.323	-74.23	-36	Pass	601
87.5	118	0.1	Peak	95.735	-74.55	-54	Pass	601
118	174	0.1	Peak	119.96	-73.69	-36	Pass	601
174	230	0.1	Peak	200.04	-69.22	-54	Pass	601
230	470	0.1	Peak	320	-67.02	-36	Pass	601
470	862	0.1	Peak	799.933	-62.5	-54	Pass	601
862	1000	0.1	Peak	879.94	-61.96	-36	Pass	601
1000	5149.5	1	Peak	5148.5	-25.94	-30	N/A	4150
			RMS		-38.01		Pass	30000
5350.5	12750	1	Peak	5359.501	-42.02	-30	Pass	7400

802.11ac80 30 MHz to 12.75 GHz, Low Sub-band, High channel



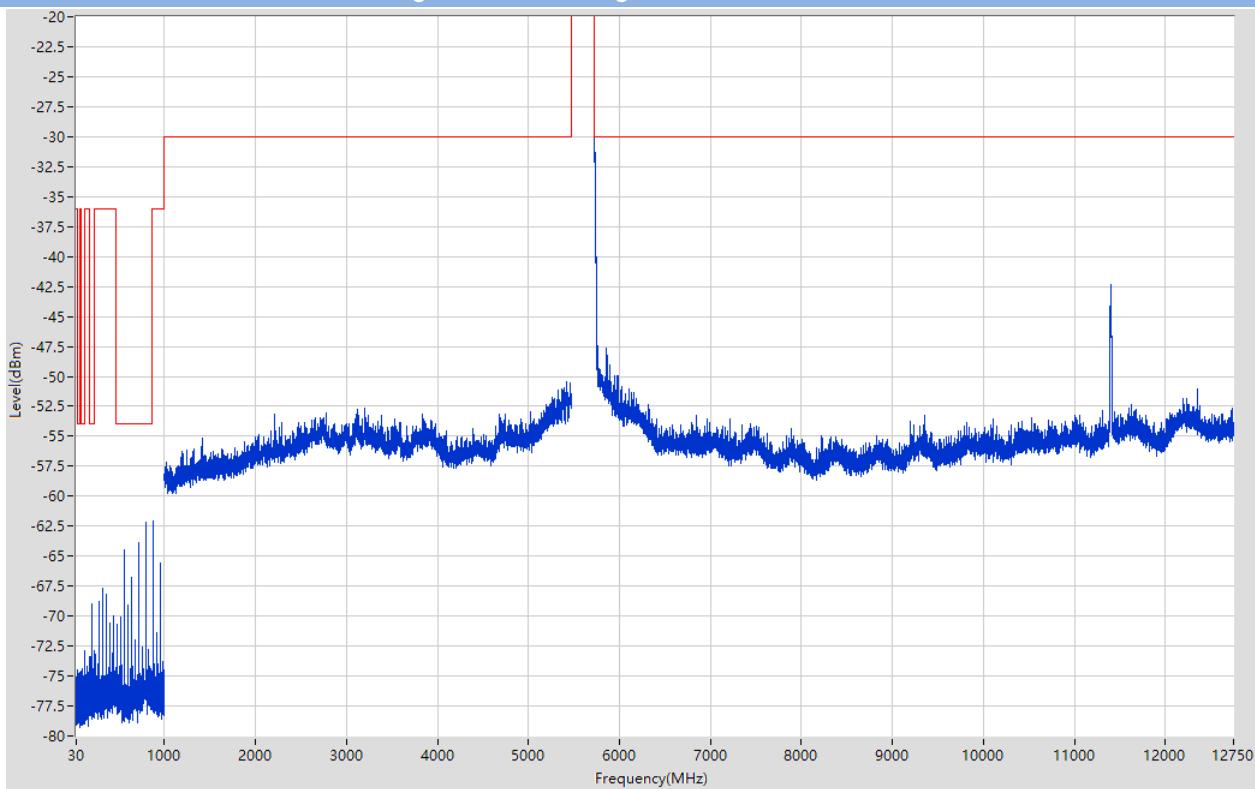
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	36.8	-74.3	-36	Pass	601
47	74	0.1	Peak	68.69	-74.01	-54	Pass	601
74	87.5	0.1	Peak	79.378	-74.21	-36	Pass	601
87.5	118	0.1	Peak	91.211	-74.49	-54	Pass	601
118	174	0.1	Peak	156.547	-73.34	-36	Pass	601
174	230	0.1	Peak	200.04	-68.61	-54	Pass	601
230	470	0.1	Peak	360	-66.88	-36	Pass	601
470	862	0.1	Peak	799.933	-63.07	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.27	-36	Pass	601
1000	5149.5	1	Peak	5134.498	-44.56	-30	Pass	4150
5350.5	12750	1	Peak	5355.5	-24.13	-30	N/A	7400
			RMS		-37.00		Pass	30000

802.11a 30 MHz to 12.75 GHz, High Sub-band, Low channel



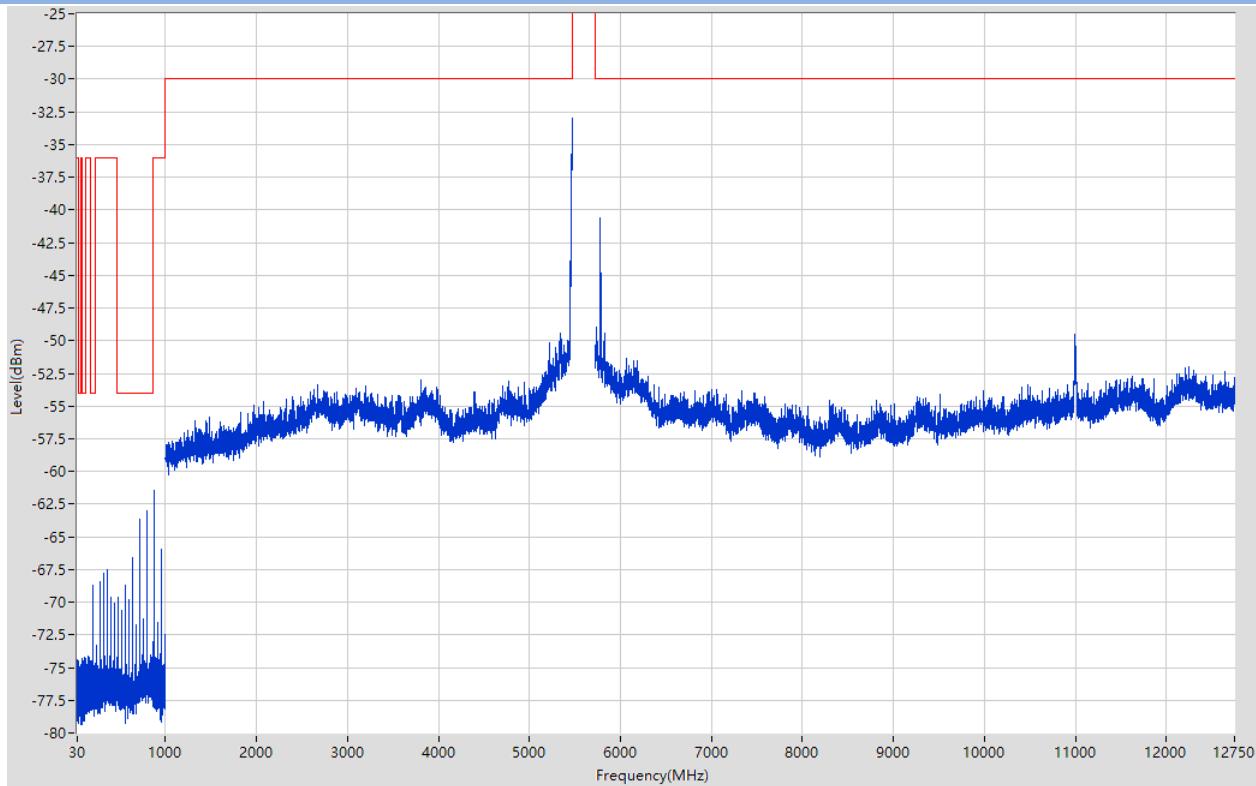
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	43.657	-74.24	-36	Pass	601
47	74	0.1	Peak	47.09	-74.49	-54	Pass	601
74	87.5	0.1	Peak	83.63	-73.51	-36	Pass	601
87.5	118	0.1	Peak	117.746	-74.27	-54	Pass	601
118	174	0.1	Peak	160.093	-73.65	-36	Pass	601
174	230	0.1	Peak	200.04	-68.55	-54	Pass	601
230	470	0.1	Peak	360	-67.26	-36	Pass	601
470	862	0.1	Peak	799.933	-62.39	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.14	-36	Pass	601
1000	5469.5	1	Peak	5469.5	-35.79	-30	Pass	4150
5725.5	12750	1	Peak	5775.817	-48.15	-30	Pass	7400

802.11a 30 MHz to 12.75 GHz, High Sub-band, High channel



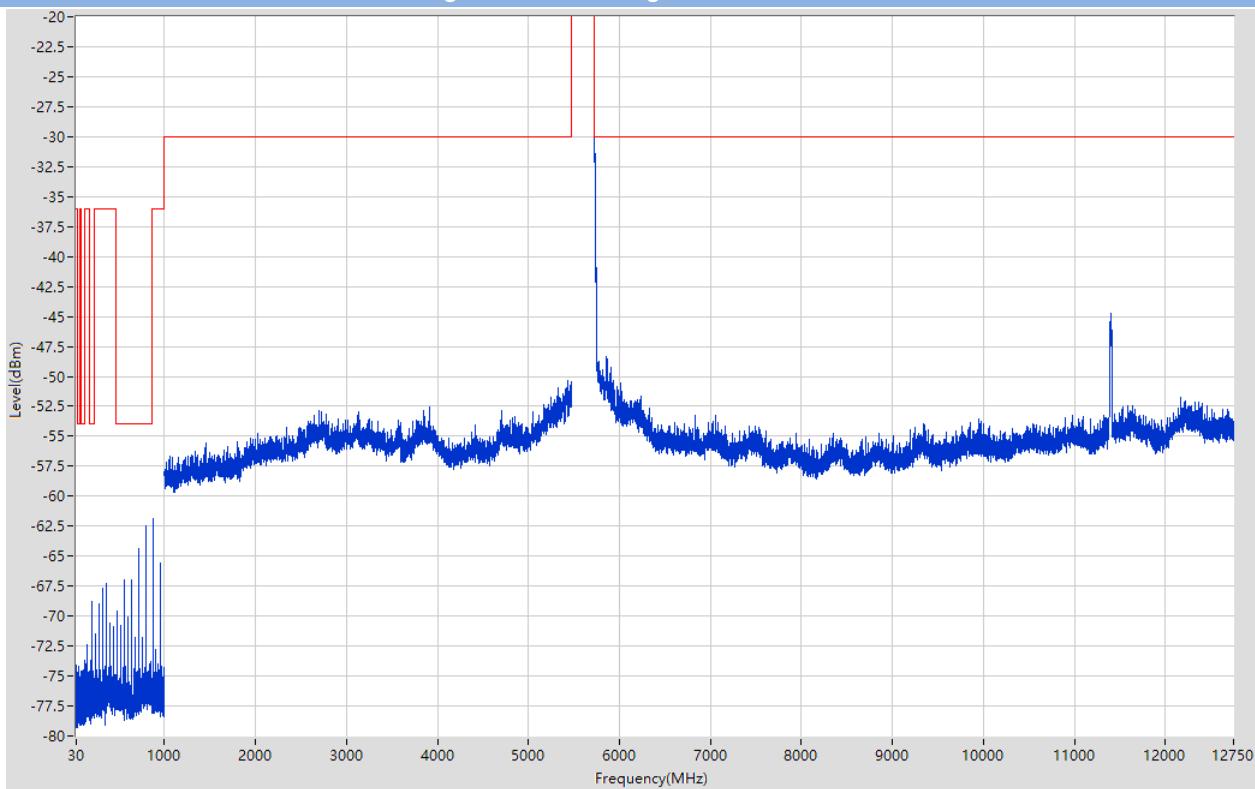
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	38.188	-74.46	-36	Pass	601
47	74	0.1	Peak	69.41	-74.68	-54	Pass	601
74	87.5	0.1	Peak	78.005	-74.62	-36	Pass	601
87.5	118	0.1	Peak	93.702	-74.42	-54	Pass	601
118	174	0.1	Peak	119.96	-72.9	-36	Pass	601
174	230	0.1	Peak	200.04	-69.01	-54	Pass	601
230	470	0.1	Peak	320	-67.73	-36	Pass	601
470	862	0.1	Peak	799.933	-62.14	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.03	-36	Pass	601
1000	5469.5	1	Peak	5414.56	-50.42	-30	Pass	4150
5725.5	12750	1	Peak	5727.399	-28.31	-30	N/A	7400
			RMS		-47.00		Pass	30000

802.11n20 30 MHz to 12.75 GHz, High Sub-band, Low channel



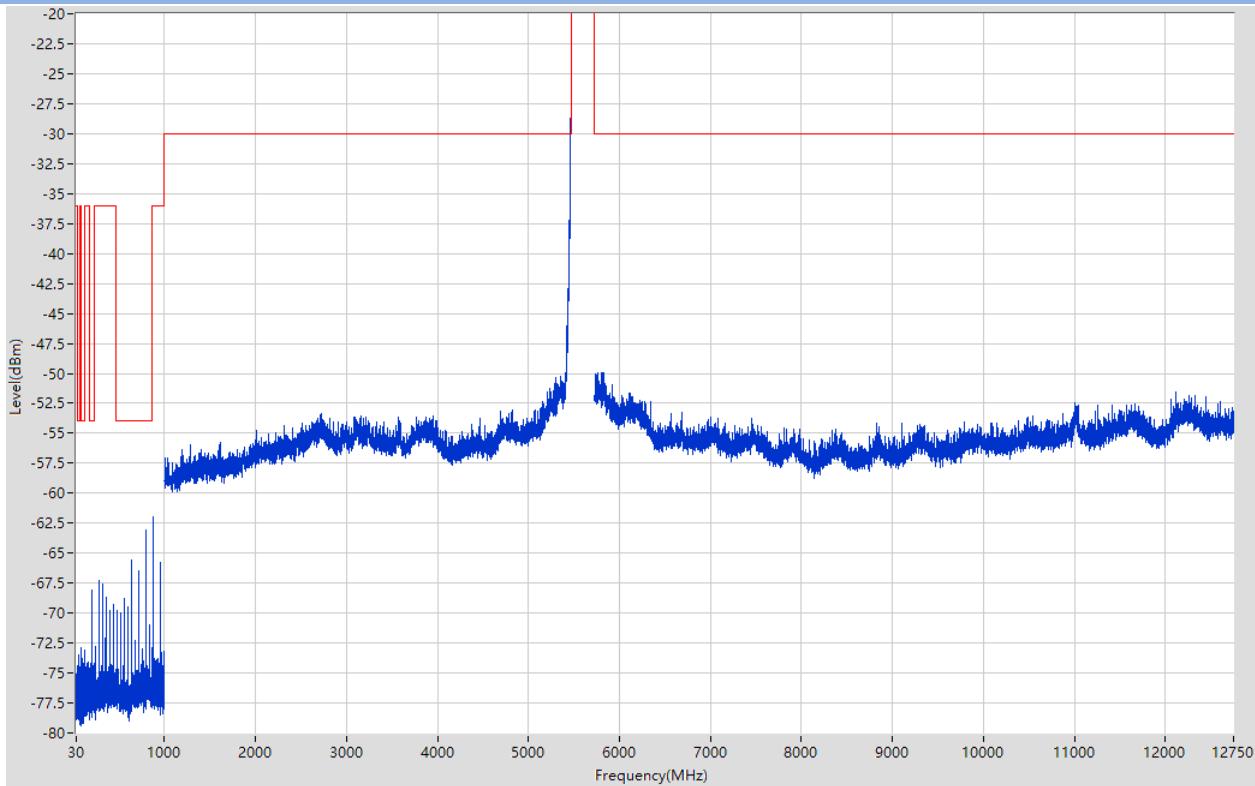
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	34.873	-74.36	-36	Pass	601
47	74	0.1	Peak	56.18	-74.92	-54	Pass	601
74	87.5	0.1	Peak	81.628	-74.3	-36	Pass	601
87.5	118	0.1	Peak	102.699	-74.24	-54	Pass	601
118	174	0.1	Peak	146.093	-74.11	-36	Pass	601
174	230	0.1	Peak	200.04	-68.75	-54	Pass	601
230	470	0.1	Peak	360	-67.48	-36	Pass	601
470	862	0.1	Peak	799.933	-62.99	-54	Pass	601
862	1000	0.1	Peak	879.94	-61.49	-36	Pass	601
1000	5469.5	1	Peak	5467.346	-32.96	-30	N/A	4150
			RMS		-51.16		Pass	30000
5725.5	12750	1	Peak	5781.514	-40.64	-30	Pass	7400

802.11n20 30 MHz to 12.75 GHz, High Sub-band, High channel



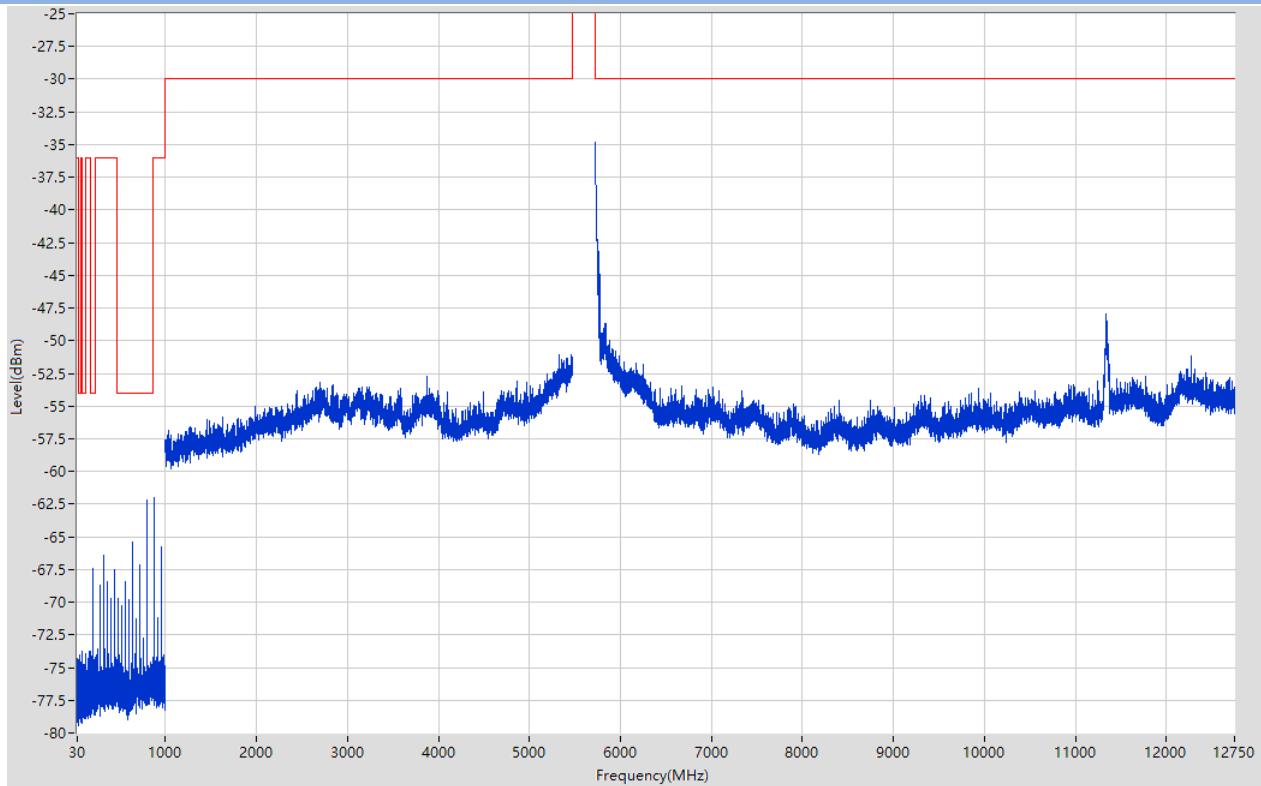
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	33.938	-74.04	-36	Pass	601
47	74	0.1	Peak	62.885	-74.17	-54	Pass	601
74	87.5	0.1	Peak	81.538	-74.61	-36	Pass	601
87.5	118	0.1	Peak	114.035	-74.45	-54	Pass	601
118	174	0.1	Peak	144.04	-72.36	-36	Pass	601
174	230	0.1	Peak	200.04	-68.8	-54	Pass	601
230	470	0.1	Peak	360	-67.23	-36	Pass	601
470	862	0.1	Peak	799.933	-62.46	-54	Pass	601
862	1000	0.1	Peak	879.94	-61.92	-36	Pass	601
1000	5469.5	1	Peak	5426.41	-50.39	-30	Pass	4150
5725.5	12750	1	Peak	5725.5	-26.14	-30	N/A	7400
			RMS		-43.25		Pass	30000

802.11n40 30 MHz to 12.75 GHz, High Sub-band, Low channel



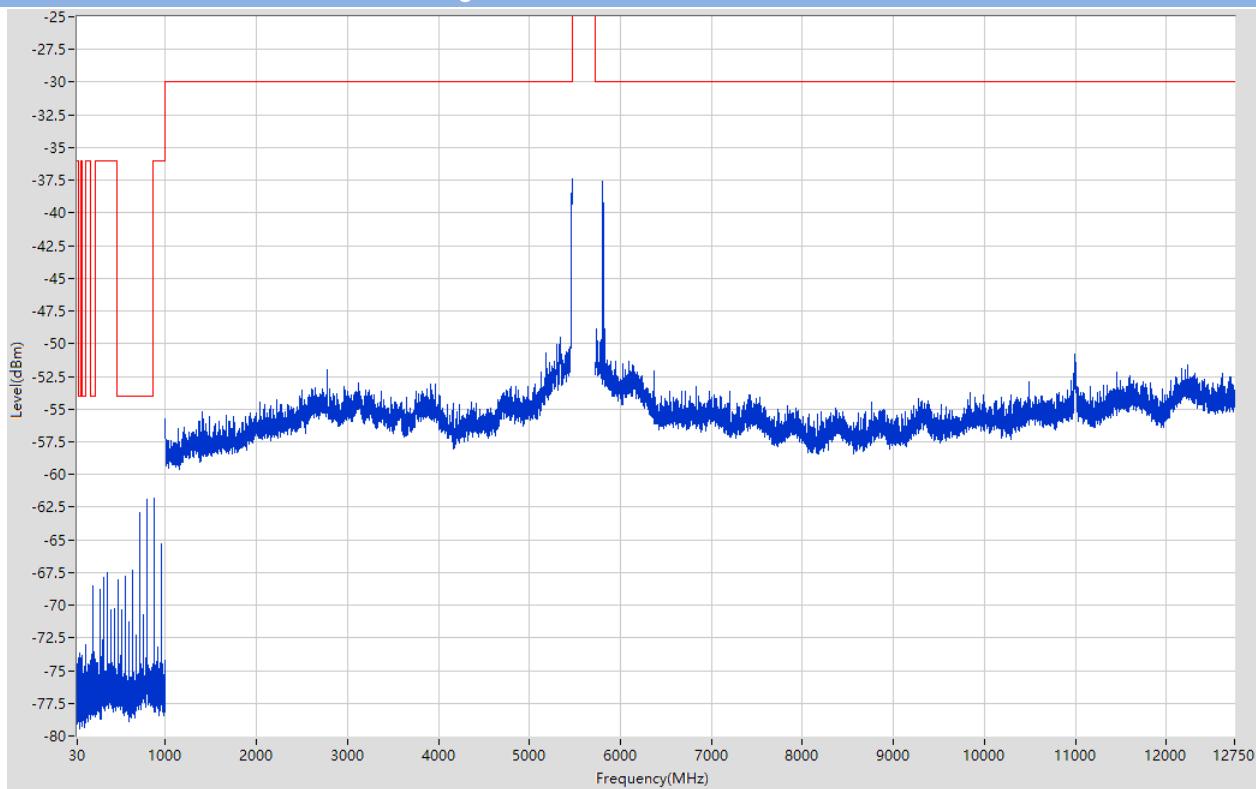
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	42.24	-74.42	-36	Pass	601
47	74	0.1	Peak	59.285	-73.51	-54	Pass	601
74	87.5	0.1	Peak	82.28	-72.93	-36	Pass	601
87.5	118	0.1	Peak	101.123	-73.76	-54	Pass	601
118	174	0.1	Peak	119.96	-73.11	-36	Pass	601
174	230	0.1	Peak	200.04	-68.04	-54	Pass	601
230	470	0.1	Peak	280	-67.24	-36	Pass	601
470	862	0.1	Peak	799.933	-63.06	-54	Pass	601
862	1000	0.1	Peak	879.94	-61.93	-36	Pass	601
1000	5469.5	1	Peak	5469.5	-26.65	-30	N/A	4150
			RMS		-38.73		Pass	30000
5725.5	12750	1	Peak	5814.742	-49.94	-30	Pass	7400

802.11n40 30 MHz to 12.75 GHz, High Sub-band, High channel



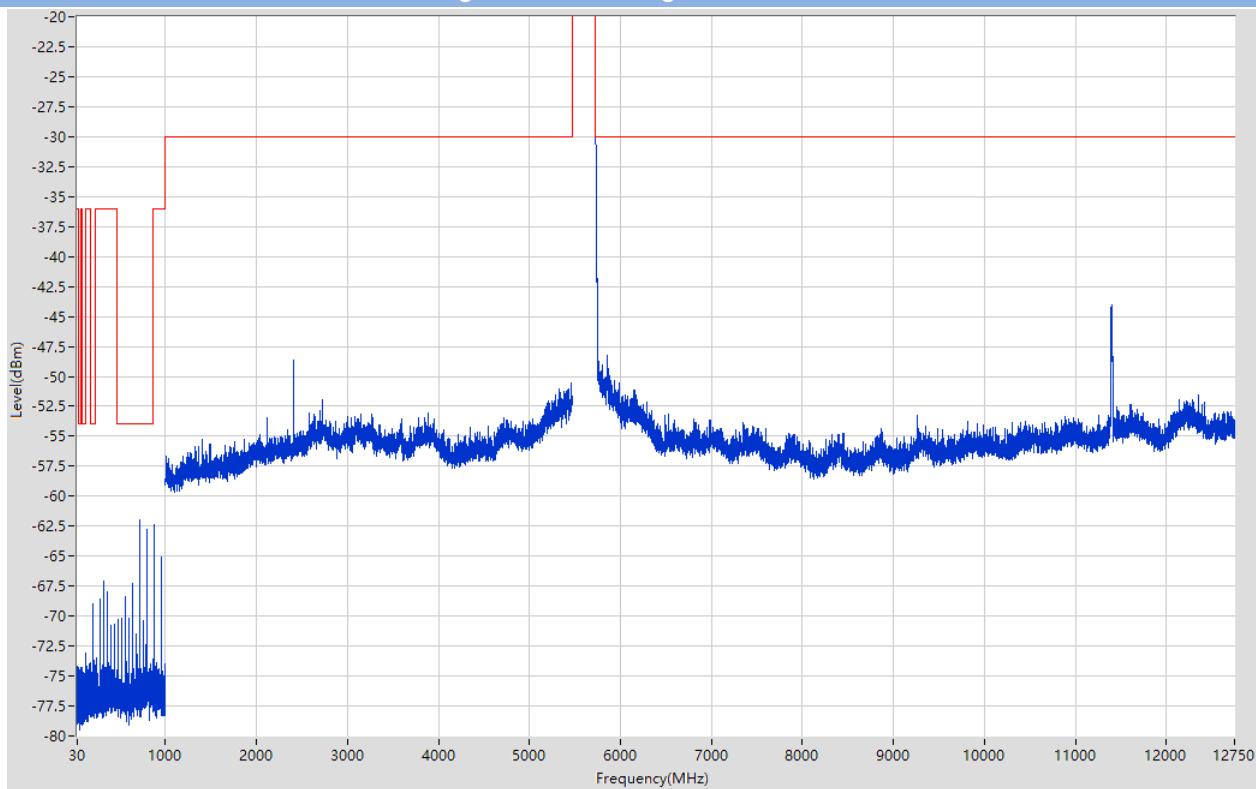
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	31.133	-74.35	-36	Pass	601
47	74	0.1	Peak	50.42	-74.03	-54	Pass	601
74	87.5	0.1	Peak	76.295	-73.8	-36	Pass	601
87.5	118	0.1	Peak	106.613	-74.76	-54	Pass	601
118	174	0.1	Peak	170.827	-73.75	-36	Pass	601
174	230	0.1	Peak	199.947	-67.46	-54	Pass	601
230	470	0.1	Peak	320	-66.41	-36	Pass	601
470	862	0.1	Peak	799.933	-62.23	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.02	-36	Pass	601
1000	5469.5	1	Peak	5320.84	-51.06	-30	Pass	4150
5725.5	12750	1	Peak	5725.5	-34.86	-30	Pass	7400

802.11ac20 30 MHz to 12.75 GHz, High Sub-band, Low channel



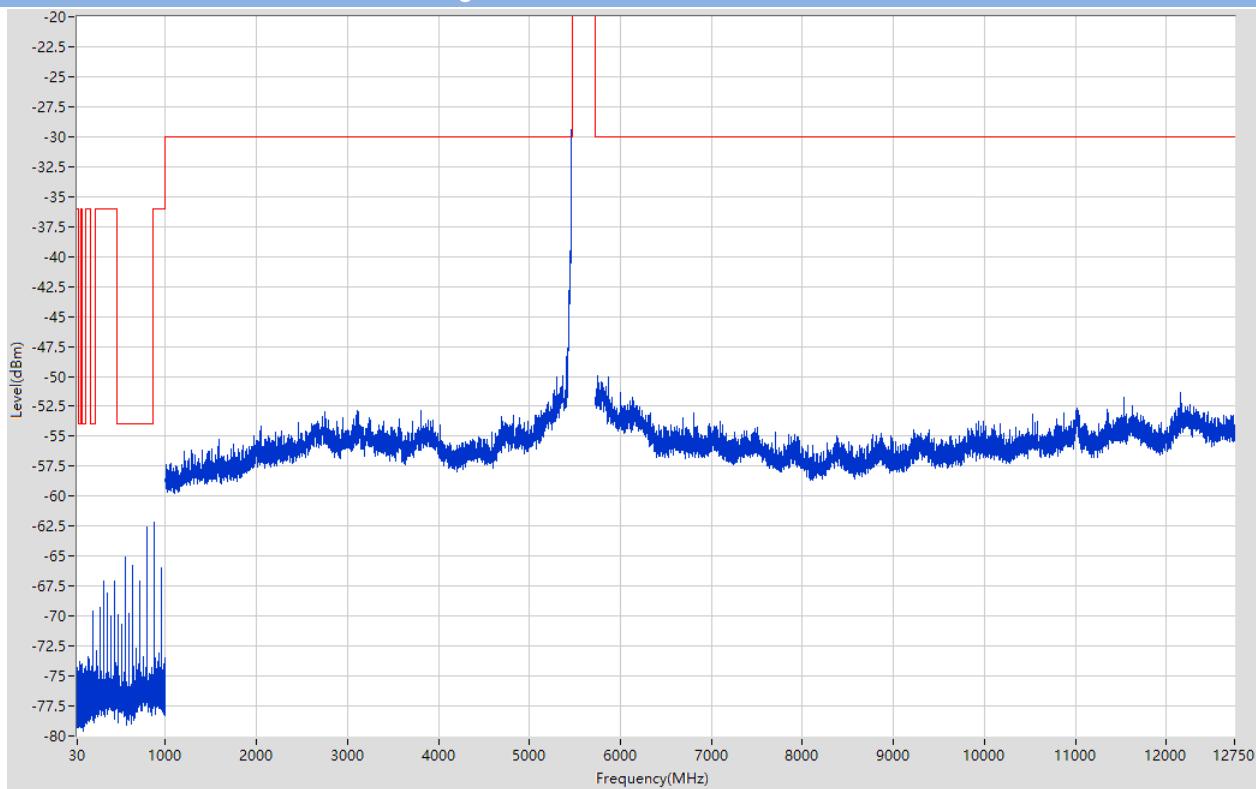
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	39.435	-74.02	-36	Pass	601
47	74	0.1	Peak	55.73	-73.7	-54	Pass	601
74	87.5	0.1	Peak	79.76	-73.87	-36	Pass	601
87.5	118	0.1	Peak	108.596	-74.66	-54	Pass	601
118	174	0.1	Peak	119.96	-72.99	-36	Pass	601
174	230	0.1	Peak	199.947	-68.56	-54	Pass	601
230	470	0.1	Peak	360	-67.55	-36	Pass	601
470	862	0.1	Peak	799.933	-61.91	-54	Pass	601
862	1000	0.1	Peak	879.94	-61.86	-36	Pass	601
1000	5469.5	1	Peak	5466.268	-37.38	-30	Pass	4150
5725.5	12750	1	Peak	5805.248	-37.56	-30	Pass	7400

802.11ac20 30 MHz to 12.75 GHz, High Sub-band, High channel



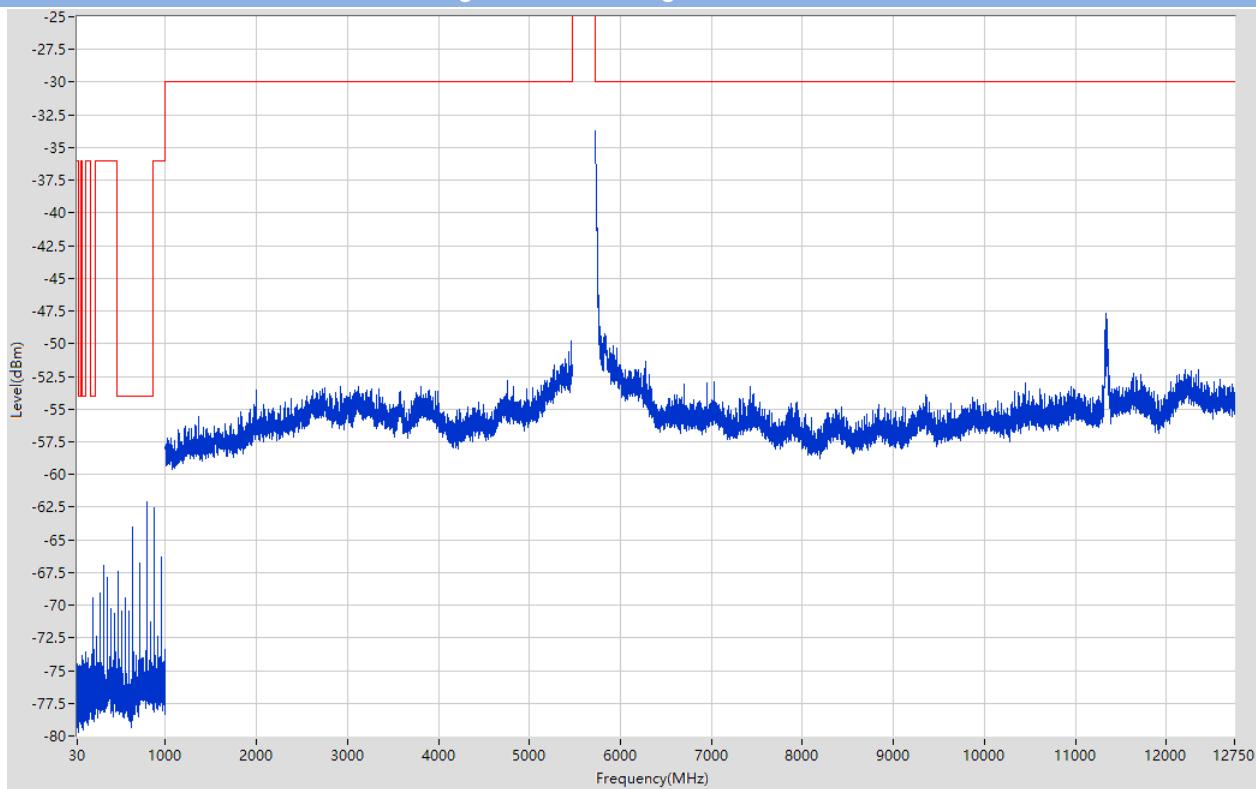
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	33.4	-74.17	-36	Pass	601
47	74	0.1	Peak	63.11	-74.25	-54	Pass	601
74	87.5	0.1	Peak	85.813	-74.29	-36	Pass	601
87.5	118	0.1	Peak	117.593	-74.55	-54	Pass	601
118	174	0.1	Peak	128.733	-73.05	-36	Pass	601
174	230	0.1	Peak	199.947	-68.95	-54	Pass	601
230	470	0.1	Peak	320	-67.06	-36	Pass	601
470	862	0.1	Peak	720.227	-61.97	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.34	-36	Pass	601
1000	5469.5	1	Peak	2410.117	-48.67	-30	Pass	4150
5725.5	12750	1	Peak	5726.449	-28.36	-30	N/A	7400
			RMS		-46.40		Pass	30000

802.11ac40 30 MHz to 12.75 GHz, High Sub-band, Low channel



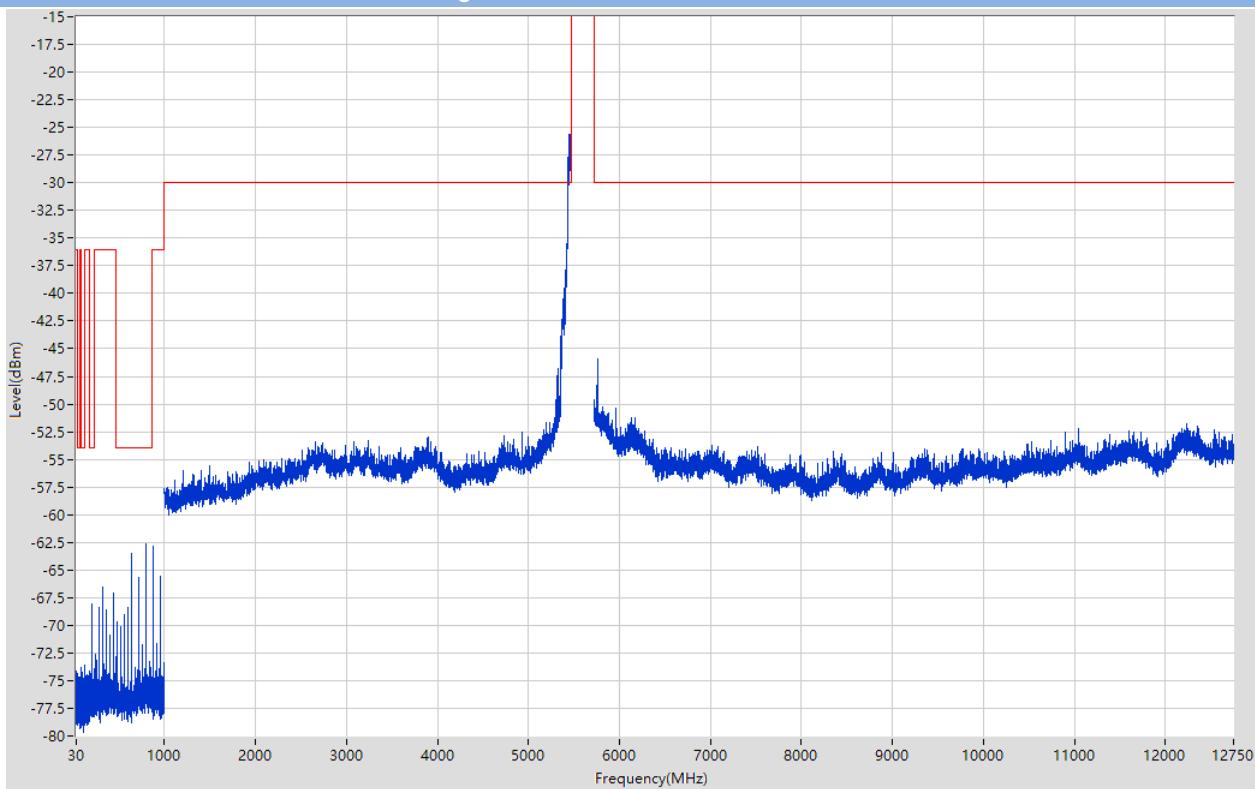
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	34.052	-74.33	-36	Pass	601
47	74	0.1	Peak	54.02	-73.76	-54	Pass	601
74	87.5	0.1	Peak	78.23	-73.99	-36	Pass	601
87.5	118	0.1	Peak	114.289	-74.36	-54	Pass	601
118	174	0.1	Peak	149.173	-73.39	-36	Pass	601
174	230	0.1	Peak	200.04	-69.62	-54	Pass	601
230	470	0.1	Peak	440	-67.04	-36	Pass	601
470	862	0.1	Peak	799.933	-62.61	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.2	-36	Pass	601
1000	5469.5	1	Peak	5468.423	-26.25	-30	N/A	4150
			RMS		-39.65		Pass	30000
5725.5	12750	1	Peak	5754.931	-49.91	-30	Pass	7400

802.11ac40 30 MHz to 12.75 GHz, High Sub-band, High channel



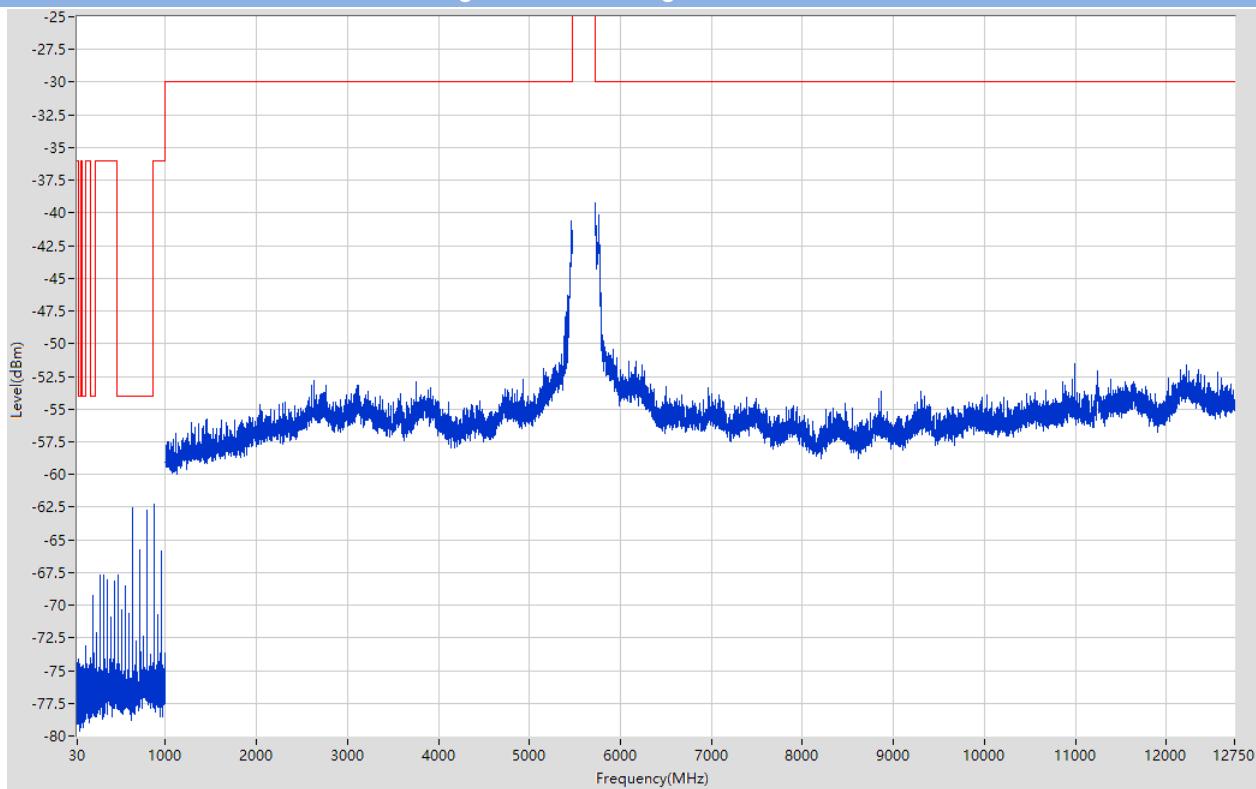
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	34.165	-74.53	-36	Pass	601
47	74	0.1	Peak	55.055	-74.57	-54	Pass	601
74	87.5	0.1	Peak	79.85	-73.89	-36	Pass	601
87.5	118	0.1	Peak	116.577	-74.06	-54	Pass	601
118	174	0.1	Peak	119.96	-73.58	-36	Pass	601
174	230	0.1	Peak	200.04	-69.41	-54	Pass	601
230	470	0.1	Peak	320	-67.01	-36	Pass	601
470	862	0.1	Peak	799.933	-62.13	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.56	-36	Pass	601
1000	5469.5	1	Peak	5454.419	-49.83	-30	Pass	4150
5725.5	12750	1	Peak	5725.5	-33.75	-30	Pass	7400

802.11ac80 30 MHz to 12.75 GHz, High Sub-band, Low channel



Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	36.318	-74.19	-36	Pass	601
47	74	0.1	Peak	59.69	-74.65	-54	Pass	601
74	87.5	0.1	Peak	79.265	-73.85	-36	Pass	601
87.5	118	0.1	Peak	92.533	-74.28	-54	Pass	601
118	174	0.1	Peak	119.96	-73.62	-36	Pass	601
174	230	0.1	Peak	200.04	-68.01	-54	Pass	601
230	470	0.1	Peak	320	-66.5	-36	Pass	601
470	862	0.1	Peak	799.933	-62.68	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.87	-36	Pass	601
1000	5469.5	1	Peak	5467.346	-23.38	-30	N/A	4150
			RMS		-36.95		Pass	30000
5725.5	12750	1	Peak	5756.83	-45.93	-30	Pass	7400

802.11ac80 30 MHz to 12.75 GHz, High Sub-band, High channel

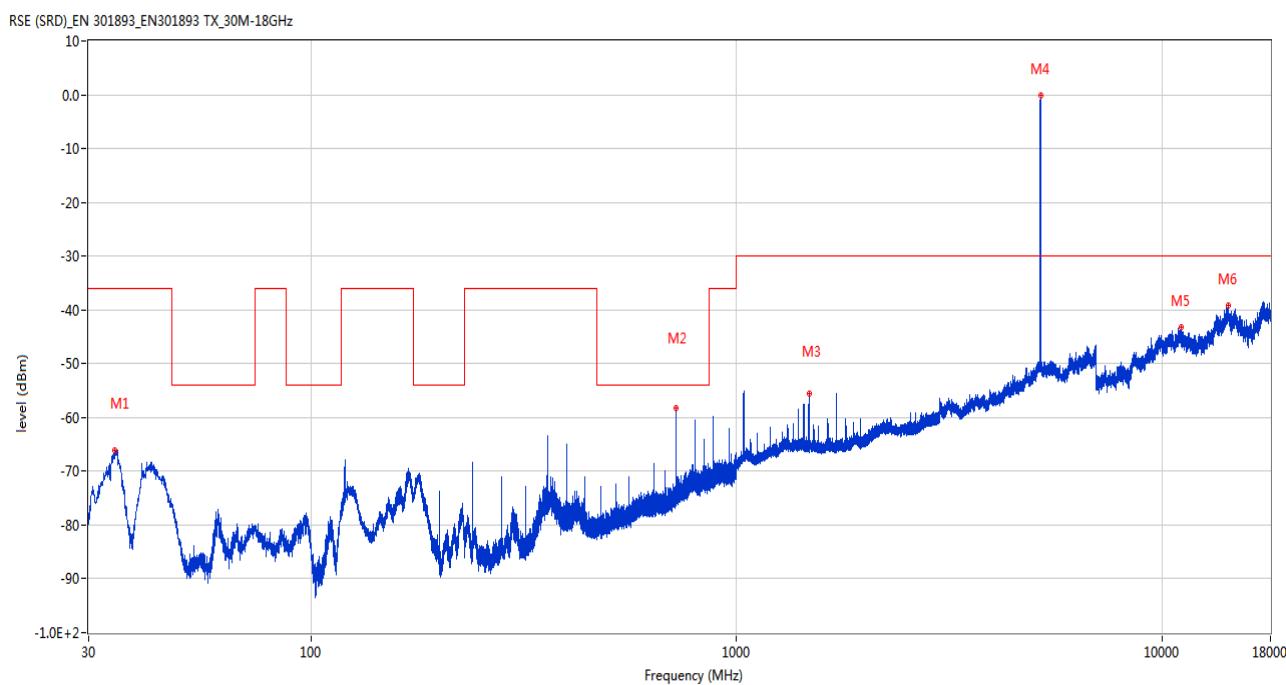


Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
30	47	0.1	Peak	43.713	-74.09	-36	Pass	601
47	74	0.1	Peak	58.565	-74.52	-54	Pass	601
74	87.5	0.1	Peak	81.965	-74.67	-36	Pass	601
87.5	118	0.1	Peak	98.734	-74.6	-54	Pass	601
118	174	0.1	Peak	120.053	-73.09	-36	Pass	601
174	230	0.1	Peak	200.04	-69.28	-54	Pass	601
230	470	0.1	Peak	280	-67.67	-36	Pass	601
470	862	0.1	Peak	639.867	-62.55	-54	Pass	601
862	1000	0.1	Peak	879.94	-62.27	-36	Pass	601
1000	5469.5	1	Peak	5455.496	-40.58	-30	Pass	4150
5725.5	12750	1	Peak	5727.399	-39.22	-30	Pass	7400

Note: The spurious above 18G is noise only, do not show on the report.

Cabinet Radiation Test Data

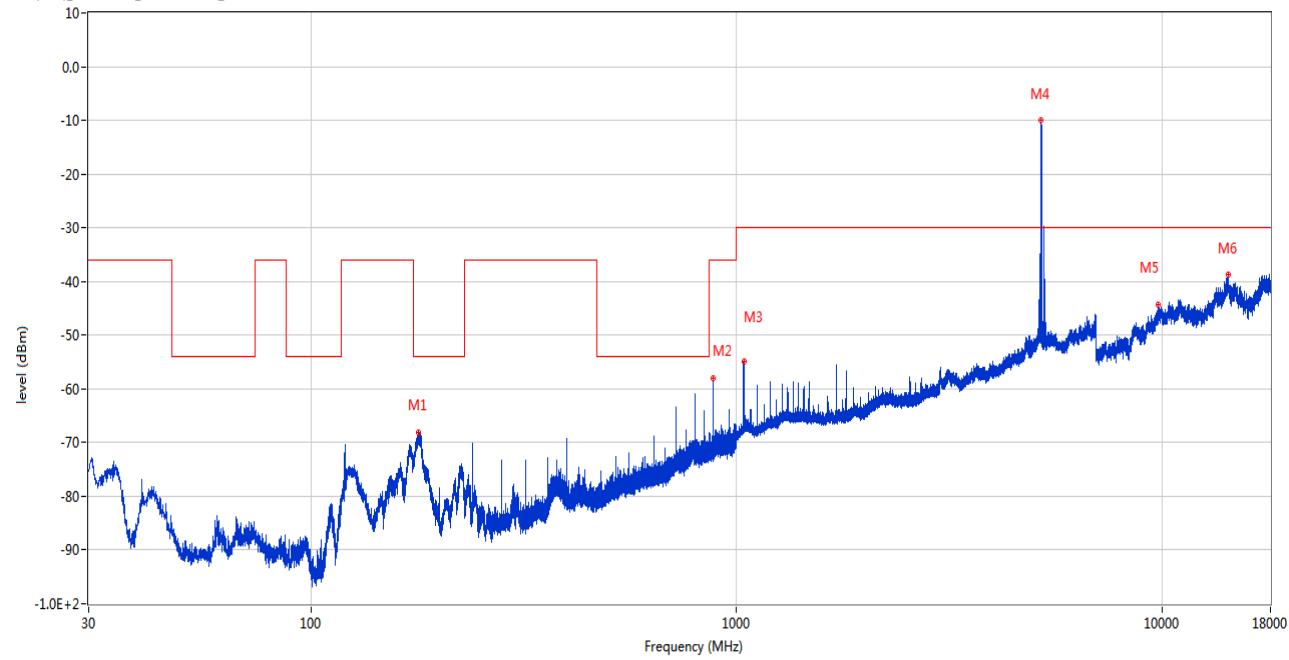
30 MHz to 18 GHz, ANT V



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
34.511	-66.09	-18.82	-36.0	-30.09	33.00	Vertical	Horizontal	Pass
720.058	-58.29	-1.10	-54.0	-4.29	170.00	Vertical	Horizontal	Pass
1480.000	-55.58	-4.98	-30.0	-25.58	331.00	Vertical	Horizontal	Pass
5187.600	-0.20	10.67	-30.0	29.80	154.00	Vertical	Horizontal	N/A
11104.925	-43.27	18.11	-30.0	-13.27	0.00	Vertical	Horizontal	Pass
14324.737	-39.23	22.10	-30.0	-9.23	26.00	Vertical	Horizontal	Pass

30 MHz to 18 GHz, ANT H

RSE (SRD)_EN 301893_EN301893 TX_30M-18GHz



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
178.750	-68.22	-14.13	-54.0	-14.22	86.00	Horizontal	Horizontal	Pass
880.011	-57.97	2.90	-36.0	-21.97	216.00	Horizontal	Horizontal	Pass
1040.000	-54.80	-5.84	-30.0	-24.80	216.00	Horizontal	Horizontal	Pass
5182.800	-9.91	10.66	-30.0	20.09	189.00	Horizontal	Horizontal	N/A
9825.549	-44.43	18.72	-30.0	-14.43	360.00	Horizontal	Horizontal	Pass
14316.075	-38.81	22.15	-30.0	-8.81	320.00	Horizontal	Horizontal	Pass

A.6 Transmitter unwanted emissions within the 5 GHz RLAN bands

Measuring Parameter (For equipment with continuous transmission capability)

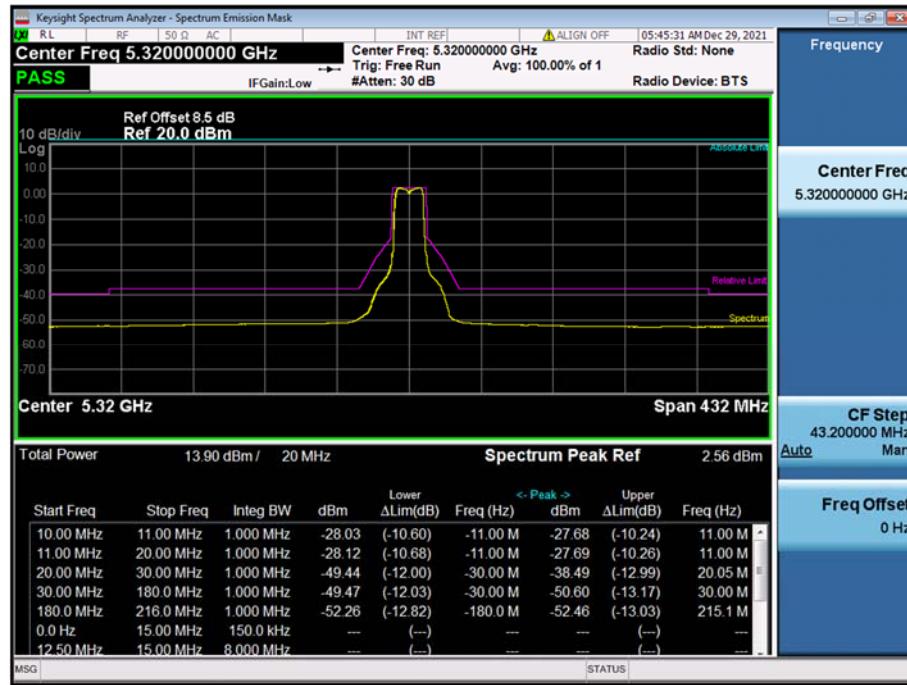
RBW (MHz)	1 MHz
VBW (MHz)	30 kHz
Detector mode	Peak
Trace mode	Video Average
Sweep time	Coupled
Test Method	<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted

Test Plots

802.11a-Low Sub-band, Low channel



802.11a-Low Sub-band, High channel



802.11a-High Sub-band, Low channel



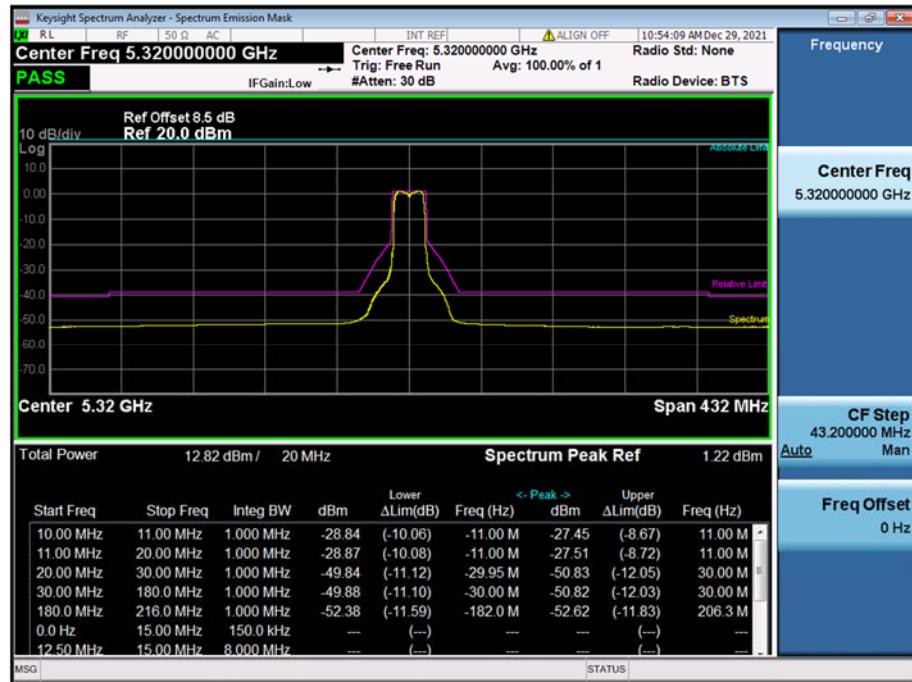
802.11a-High Sub-band, High channel



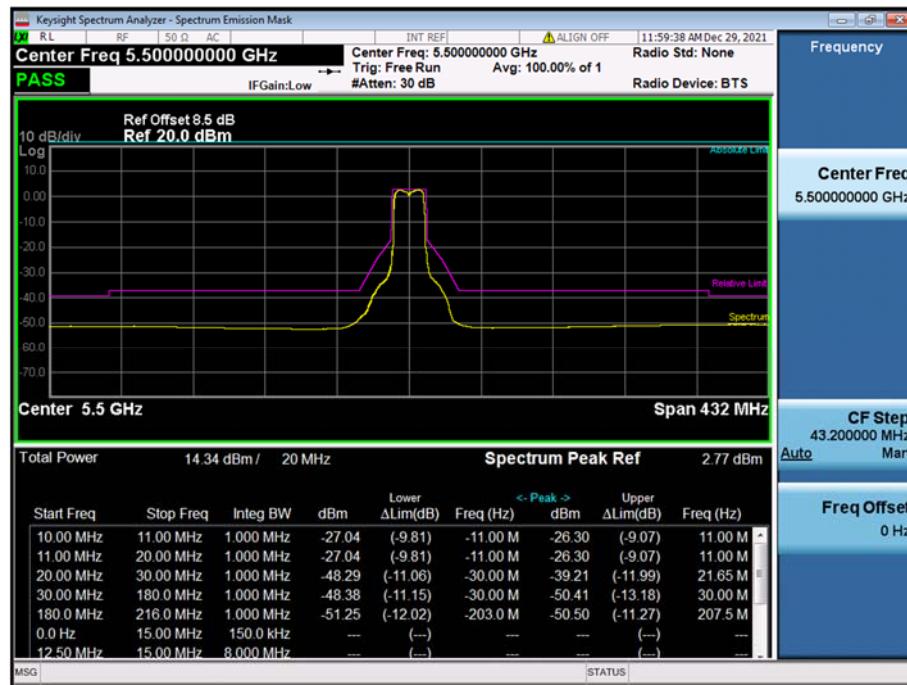
802.11n(20 MHz)–Low Sub-band, Low channel



802.11n(20 MHz)–Low Sub-band, High channel



802.11n(20 MHz)–High Sub-band, Low channel



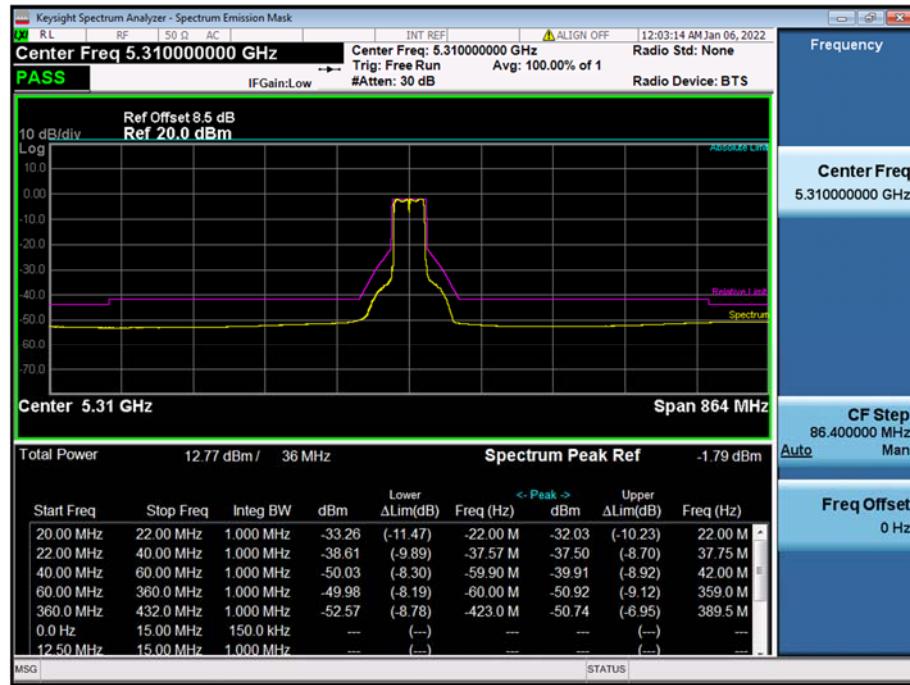
802.11n(20 MHz)–High Sub-band, High channel



802.11n(40 MHz)–Low Sub-band, Low channel



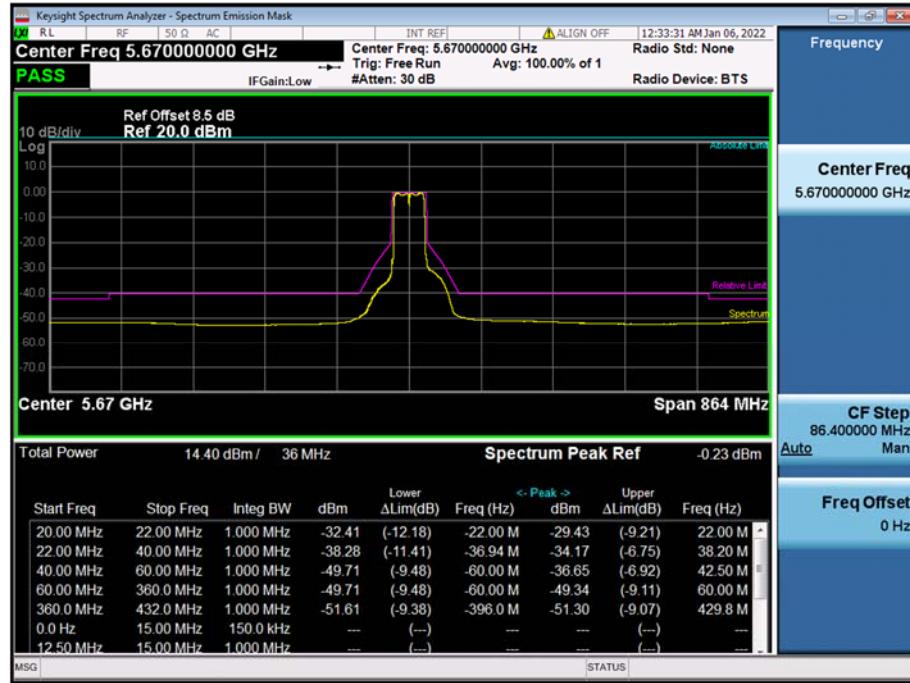
802.11n(40 MHz)–Low Sub-band, High channel



802.11n(40 MHz)–High Sub-band, Low channel



802.11n(40 MHz)–High Sub-band, High channel



802.11ac(20 MHz)–Low Sub-band, Low channel



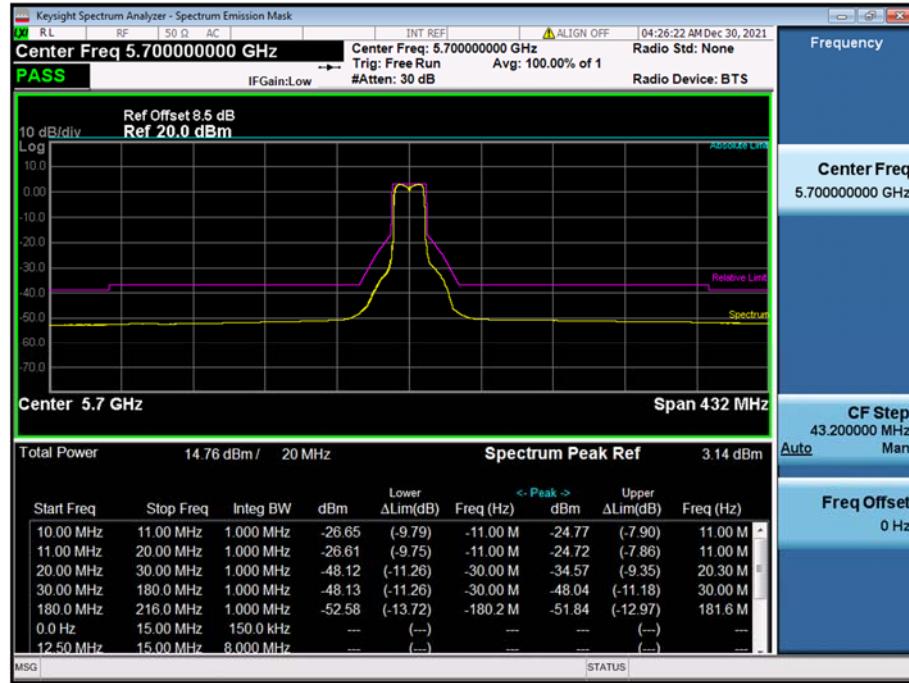
802.11ac(20 MHz)–Low Sub-band, High channel



802.11ac(20 MHz)–High Sub-band, Low channel



802.11ac(20 MHz)–High Sub-band, High channel



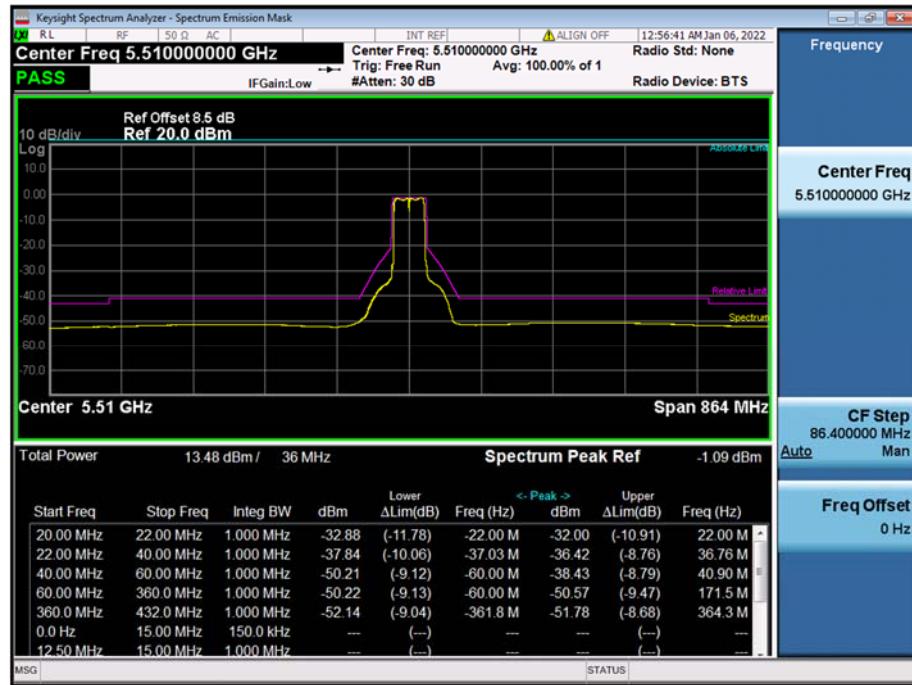
802.11ac(40 MHz)–Low Sub-band, Low channel



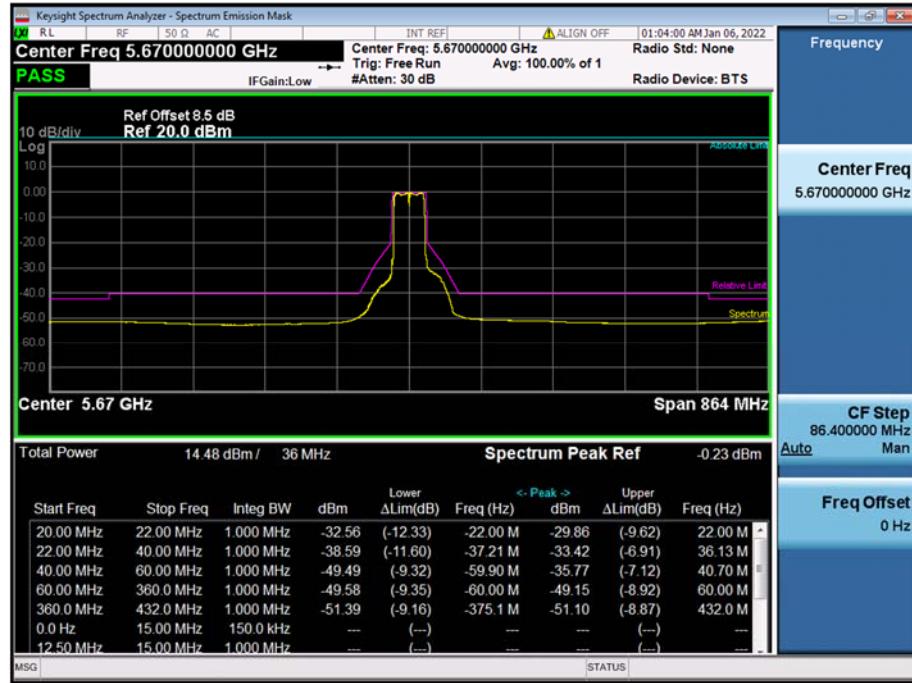
802.11ac(40 MHz)–Low Sub-band, High channel



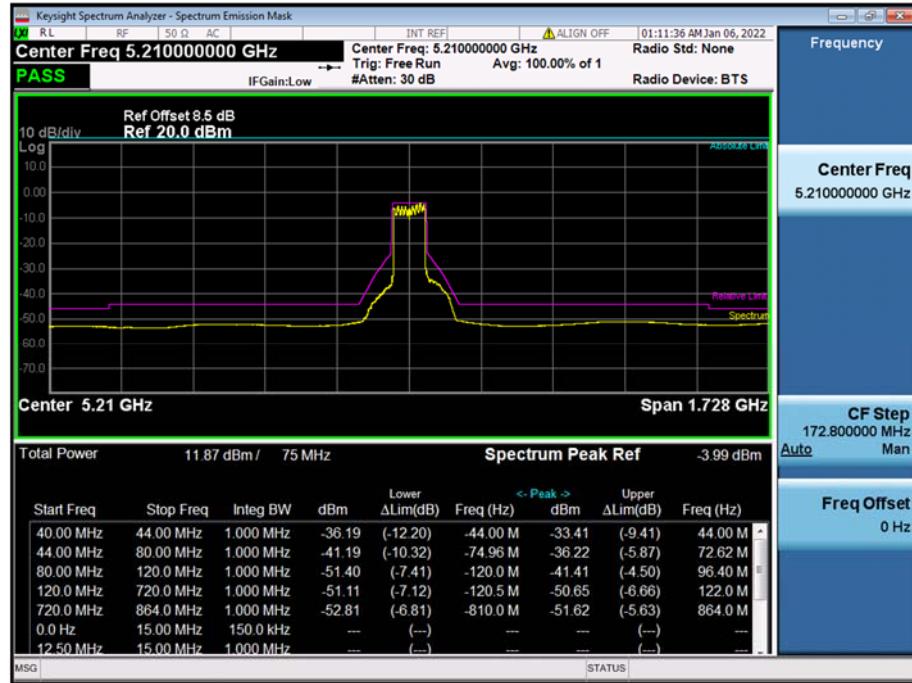
802.11ac(40 MHz)–High Sub-band, Low channel



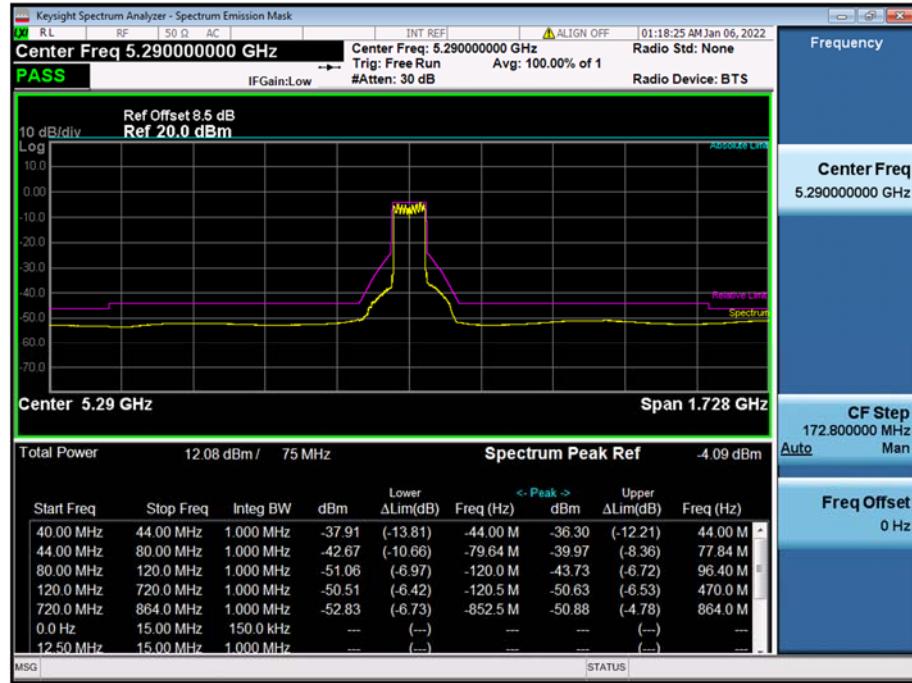
802.11ac(40 MHz)–High Sub-band, High channel



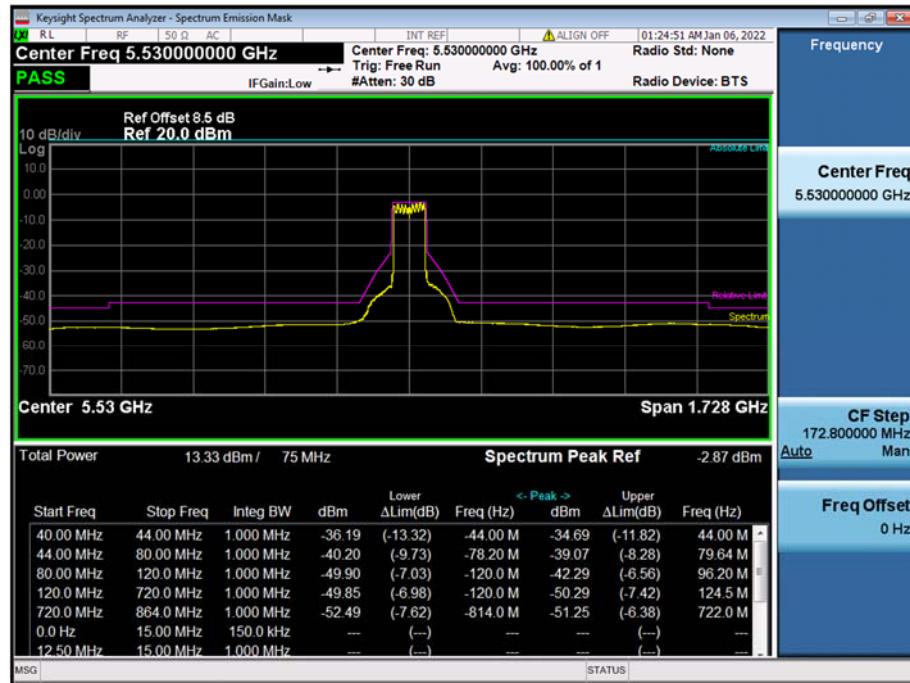
802.11ac(80 MHz)–Low Sub-band, Low channel



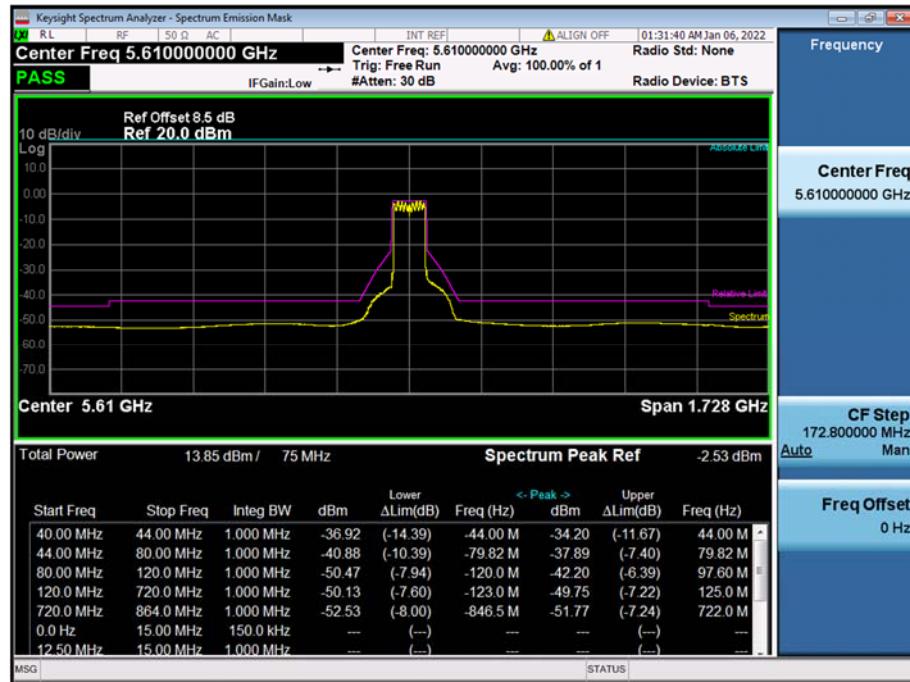
802.11ac(80 MHz)–Low Sub-band, High channel



802.11ac(80 MHz)–High Sub-band, Low channel



802.11ac(80 MHz)–High Sub-band, High channel



A.7 Receiver Spurious Emissions

Note ¹: The test method choose the conducted method. Which power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment (cabinet radiation).

Note ²: The Frequency band was pre-scanned, the harmonic and other spurious which worst frequency are recorded in the report.

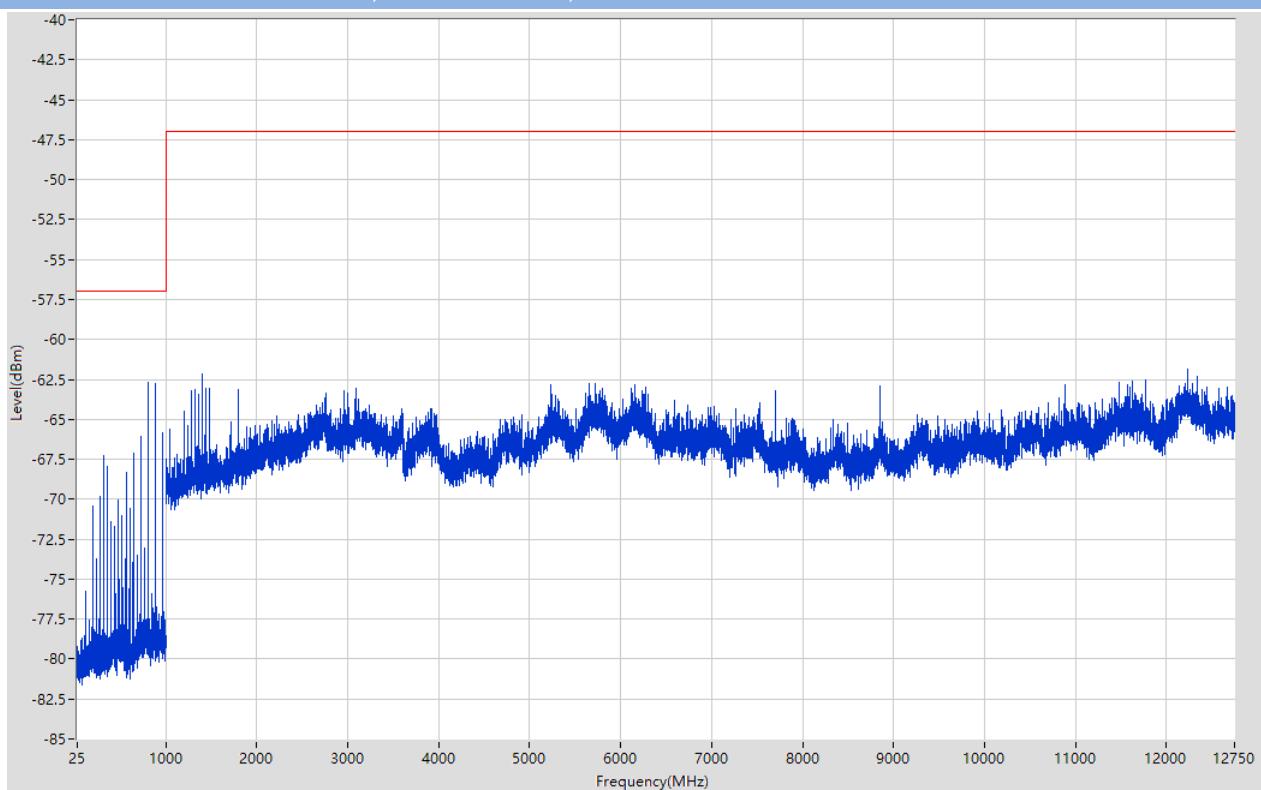
Measuring Parameter

Frequency Range	RBW (MHz)	100 kHz
30 MHz to 1 000 MHz	VBW (MHz)	300 kHz
	Sweep points	9700
	Detector mode	Peak
	Trace mode	Max Hold
	RBW (MHz)	1 MHz
1 GHz to 26 GHz	VBW (MHz)	3 MHz
	Sweep points	25000
	Detector mode	Peak
	Trace mode	Max Hold

Note: The spurious above 12.75G is noise only, do not show on the report.

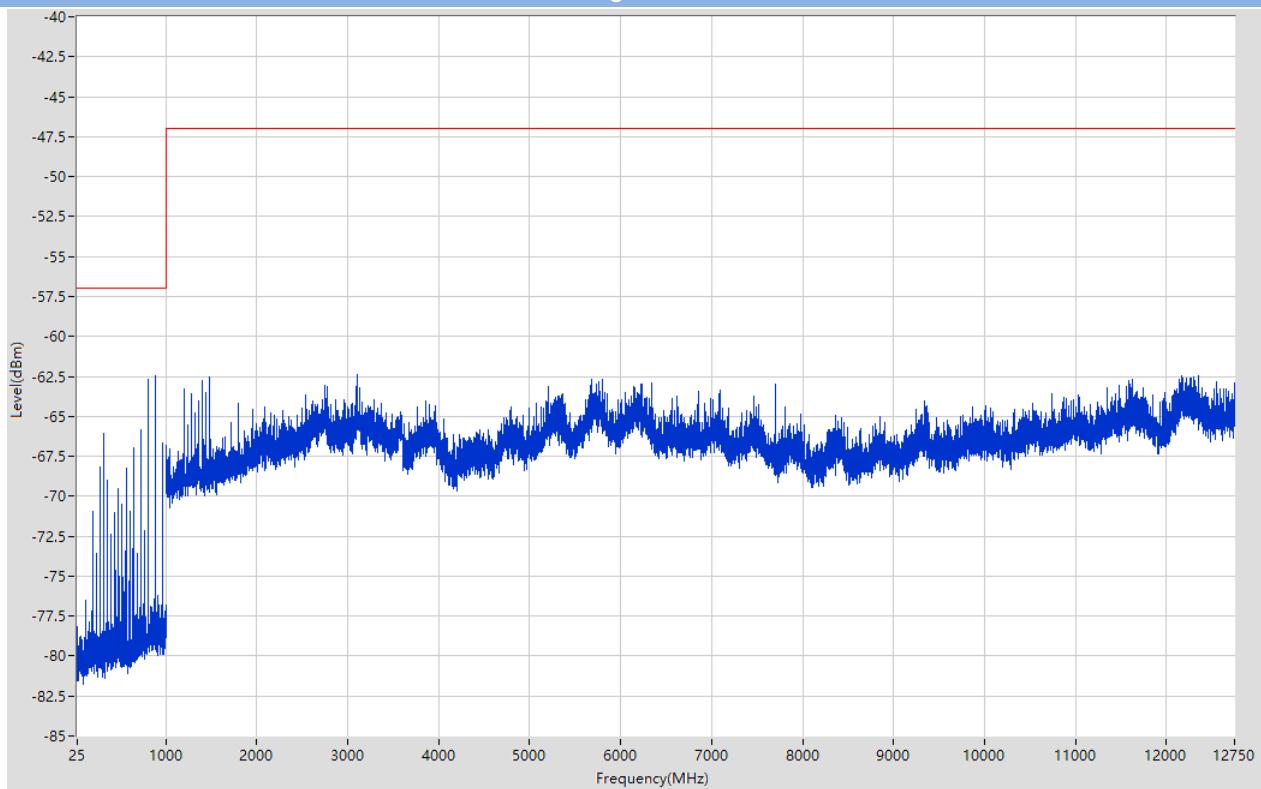
Conducted Test Data

802.11a 30 MHz to 12.75 GHz, Low Sub-band, Low channel



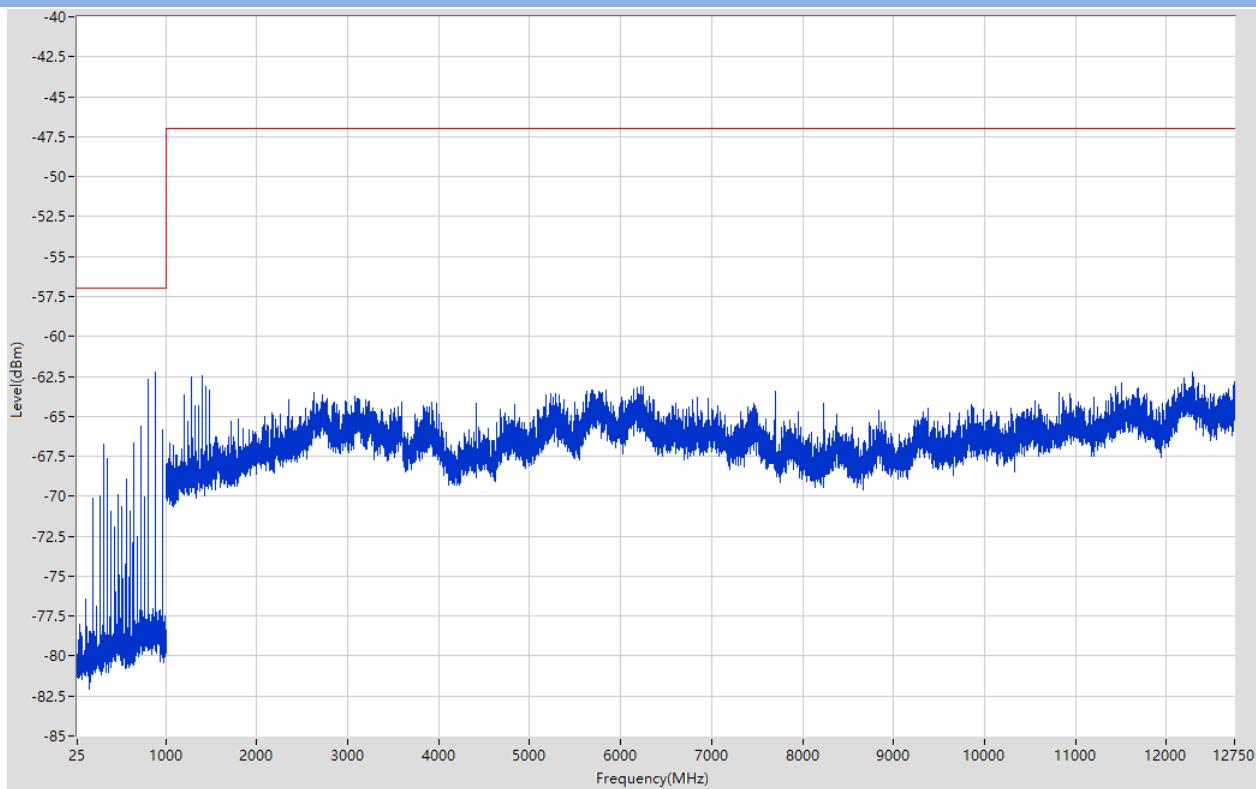
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.67	-57	N/A	1001
			RMS		-72.45		Pass	30000
1000	12750	1	Peak	12240.957	-61.85	-47	Pass	11750

802.11a 30 MHz to 12.75 GHz, Low Sub-band, High channel



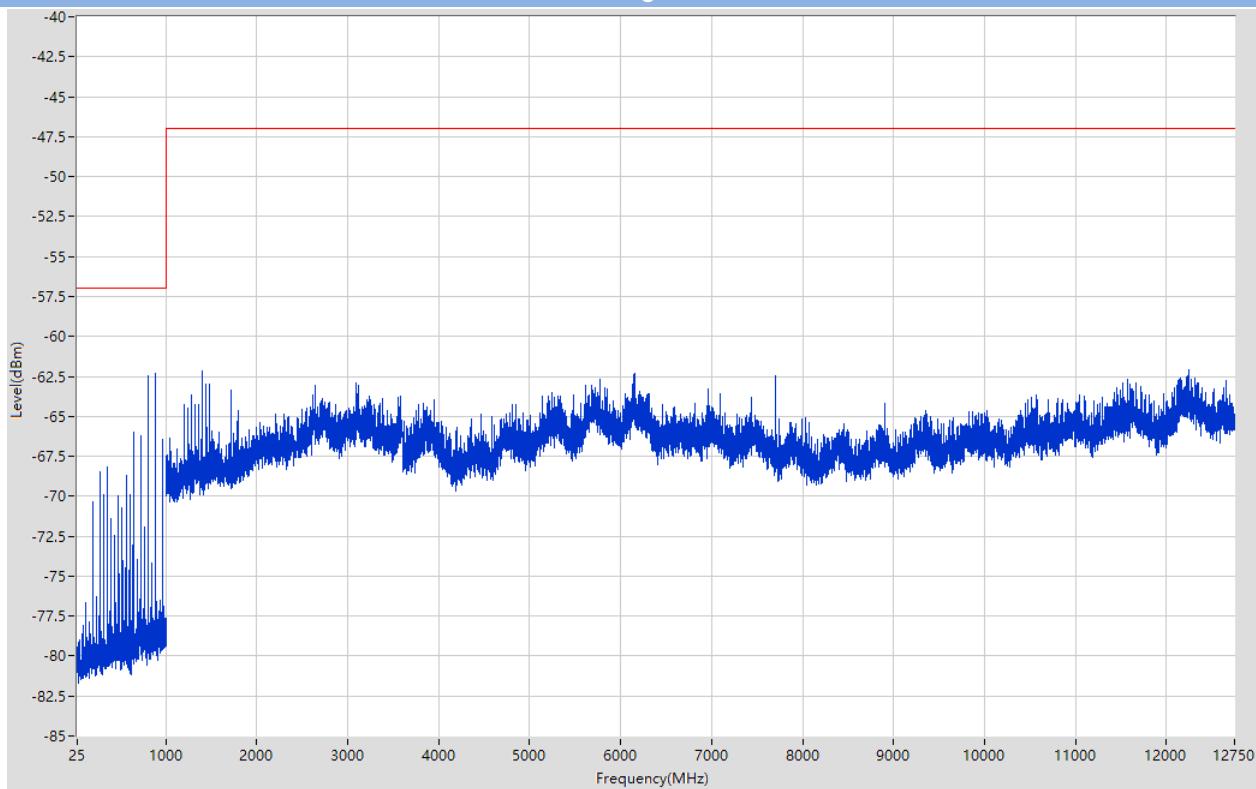
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.47	-57	N/A	1001
			RMS		-67.69		Pass	30000
1000	12750	1	Peak	3102.179	-62.41	-47	Pass	11750

802.11n20 30 MHz to 12.75 GHz, Low Sub-band, Low channel



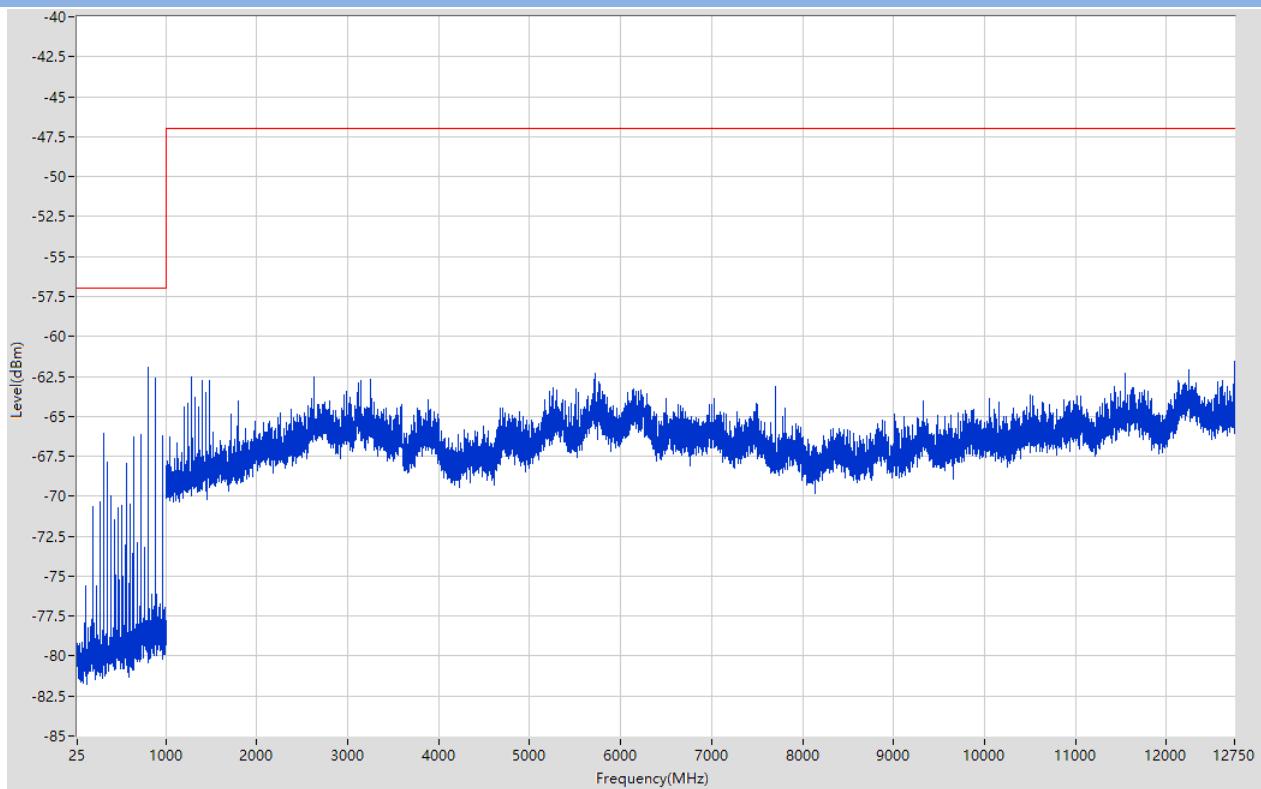
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.23	-57	N/A	1001
			RMS		-67.67		Pass	30000
1000	12750	1	Peak	12283.96	-62.21	-47	Pass	11750

802.11n20 30 MHz to 12.75 GHz, Low Sub-band, High channel



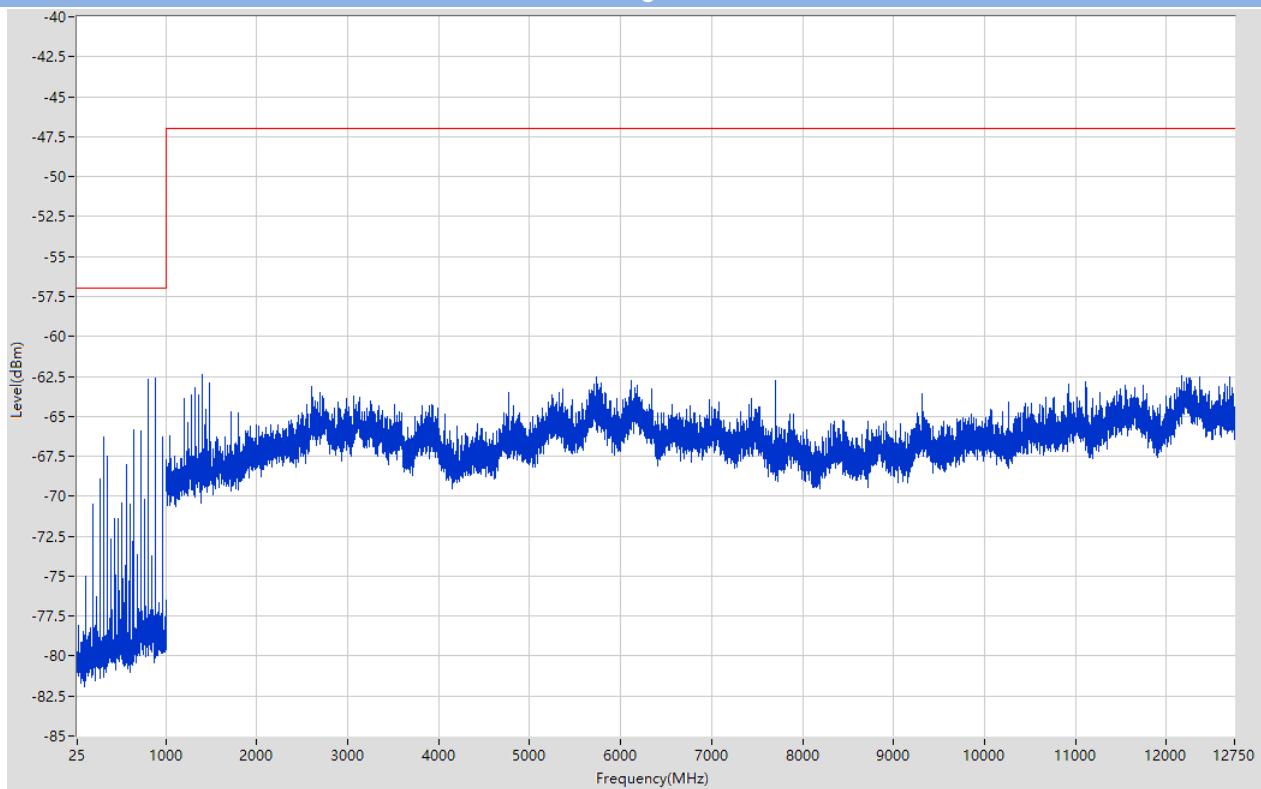
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.34	-57	N/A	1001
			RMS		-67.63		Pass	30000
1000	12750	1	Peak	12244.957	-62.07	-47	Pass	11750

802.11n40 30 MHz to 12.75 GHz, Low Sub-band, Low channel



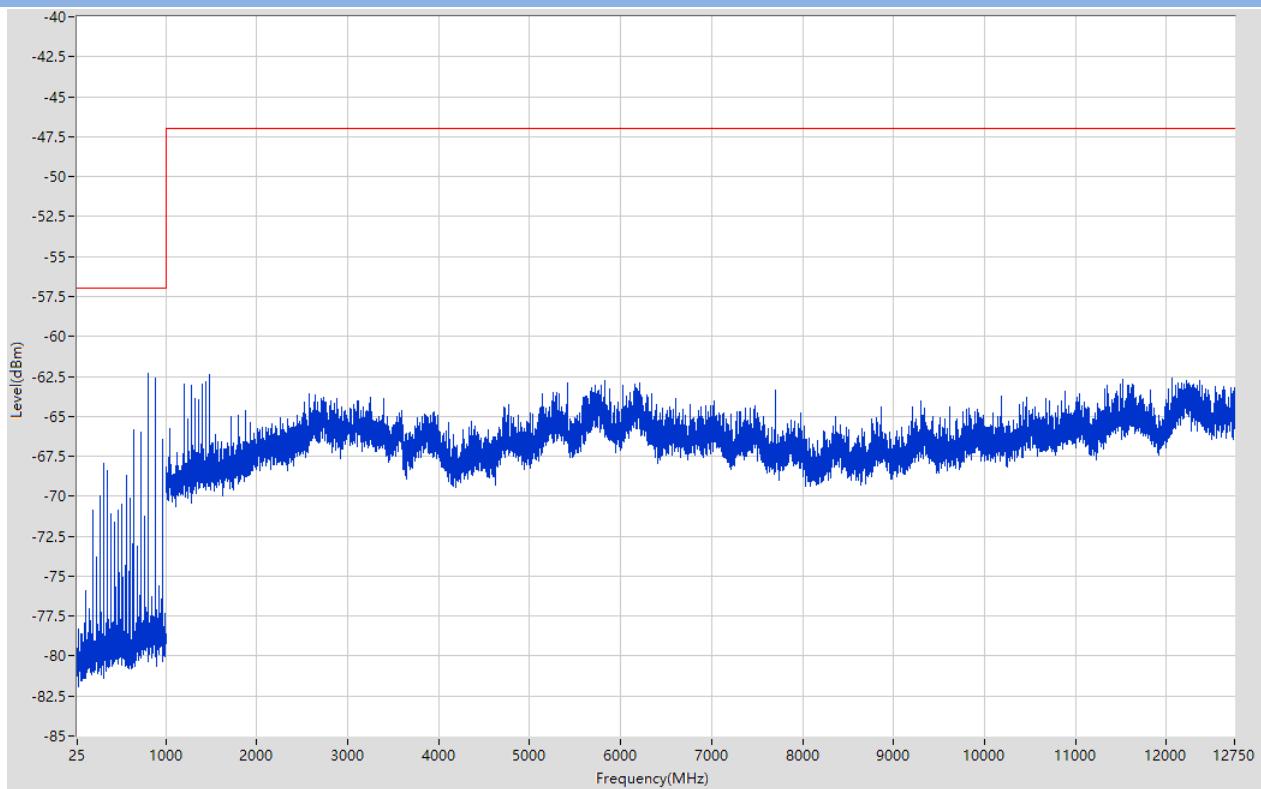
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-61.92	-57	N/A	1001
			RMS		-72.38		Pass	30000
1000	12750	1	Peak	12743.999	-61.54	-47	Pass	11750

802.11n40 30 MHz to 12.75 GHz, Low Sub-band, High channel



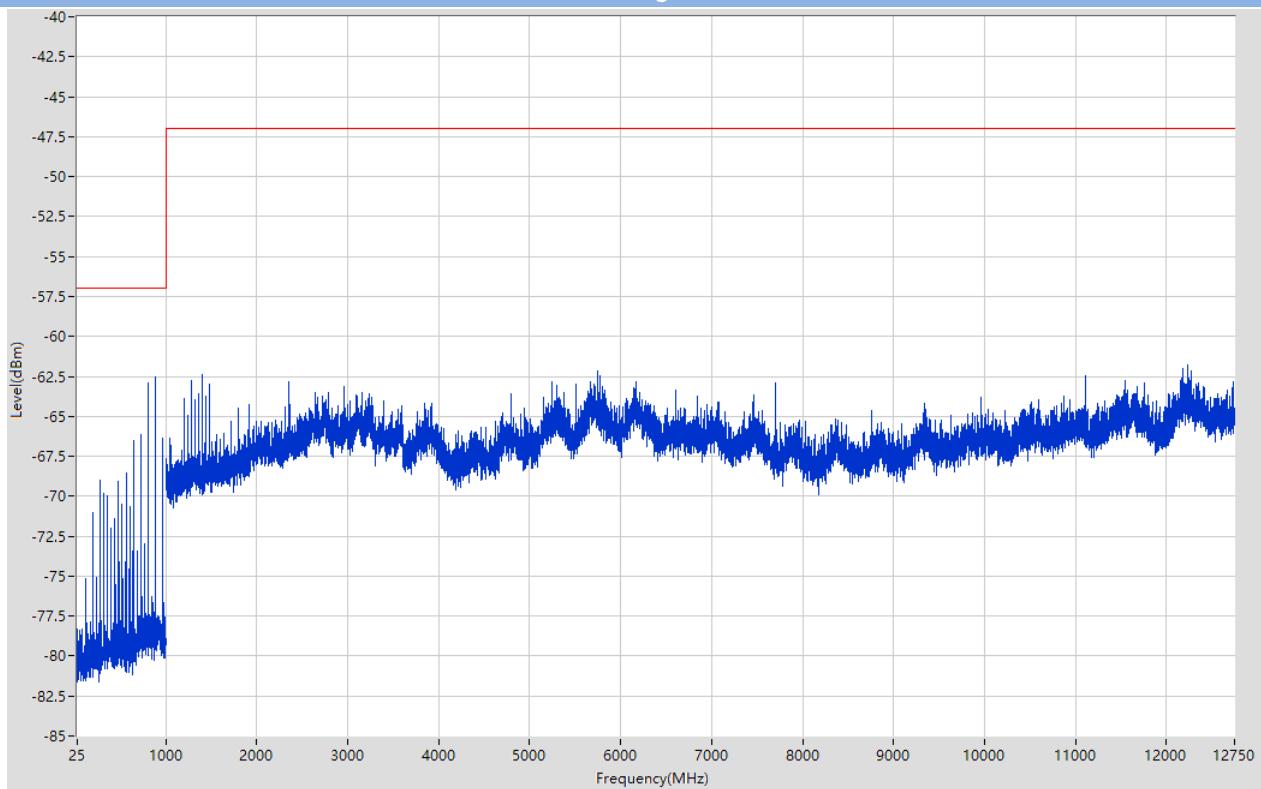
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.65	-57	N/A	1001
			RMS		-67.52		Pass	30000
1000	12750	1	Peak	1400.034	-62.38	-47	Pass	11750

802.11ac20 30 MHz to 12.75 GHz, Low Sub-band, Low channel



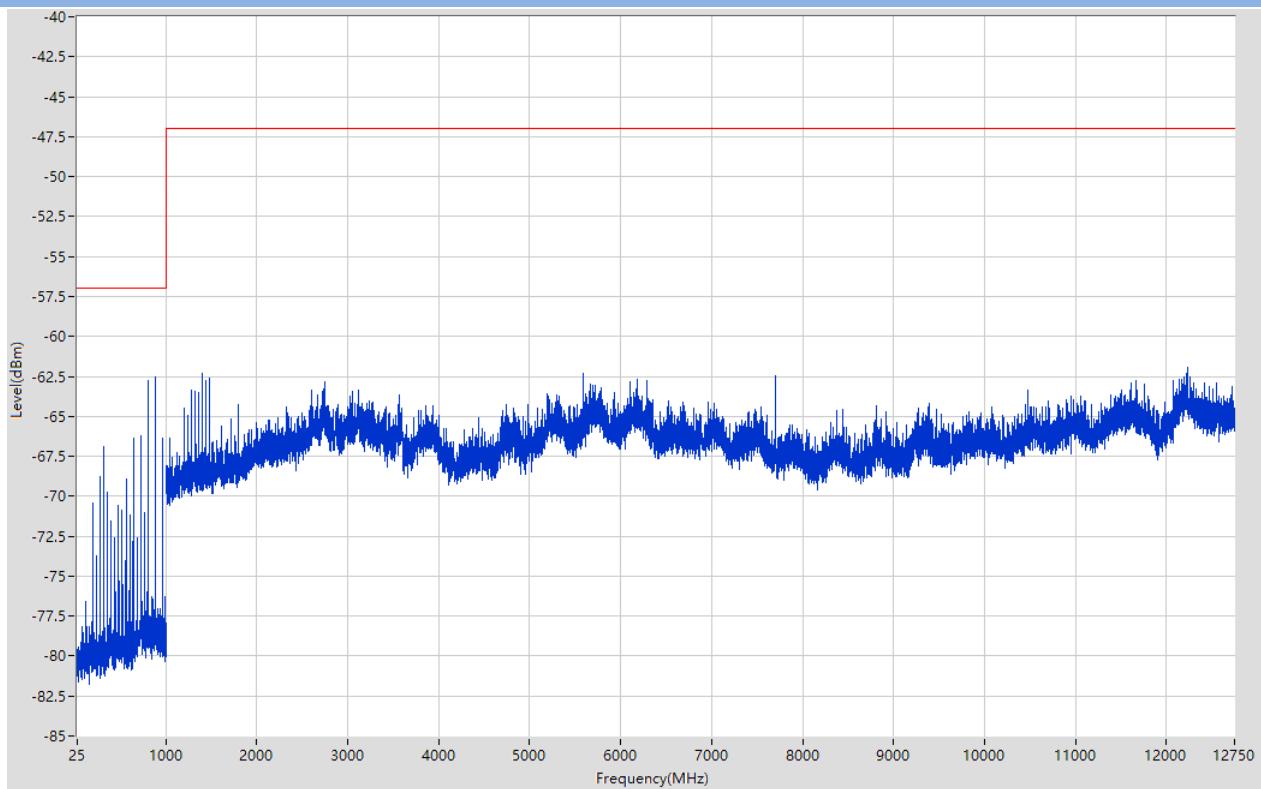
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.32	-57	N/A	1001
			RMS		-72.34		Pass	30000
1000	12750	1	Peak	1480.041	-62.4	-47	Pass	11750

802.11ac20 30 MHz to 12.75 GHz, Low Sub-band, High channel



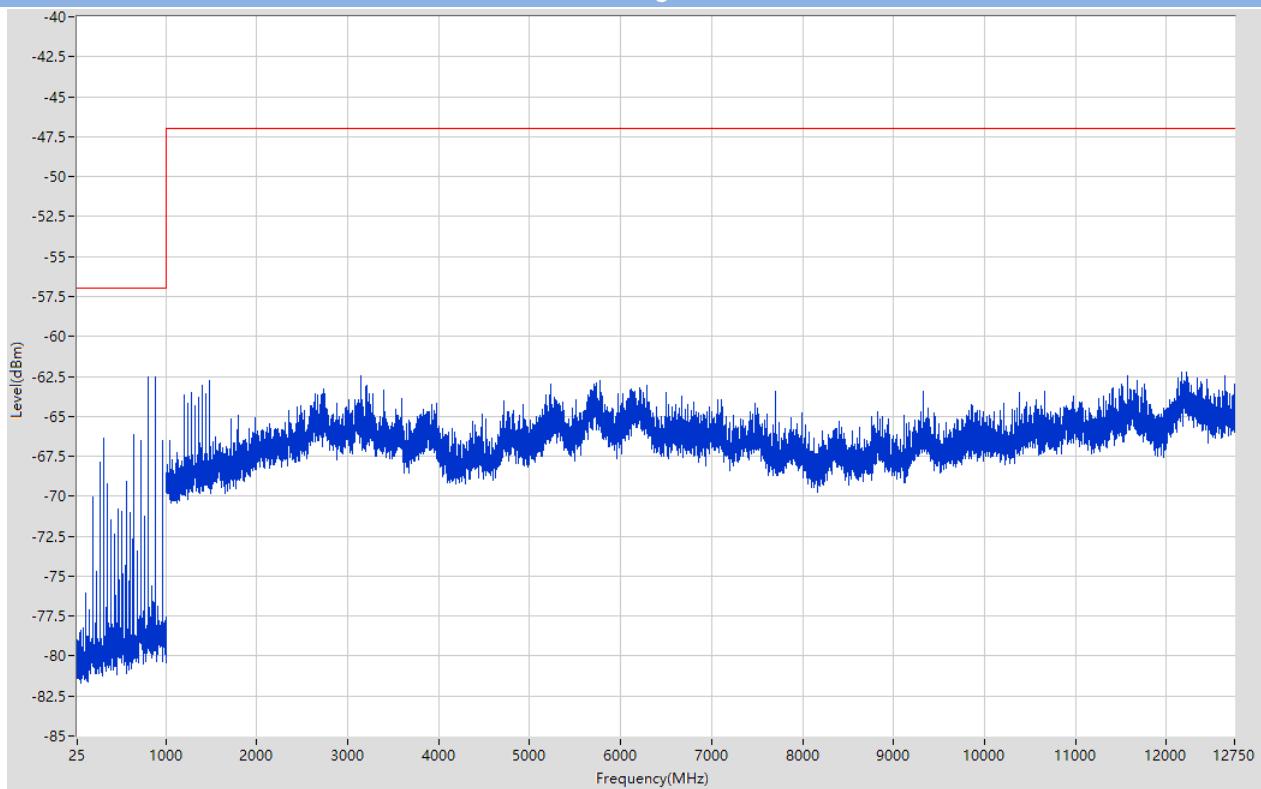
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.52	-57	N/A	1001
			RMS		-67.71		Pass	30000
1000	12750	1	Peak	12232.956	-61.77	-47	Pass	11750

802.11ac40 30 MHz to 12.75 GHz, Low Sub-band, Low channel



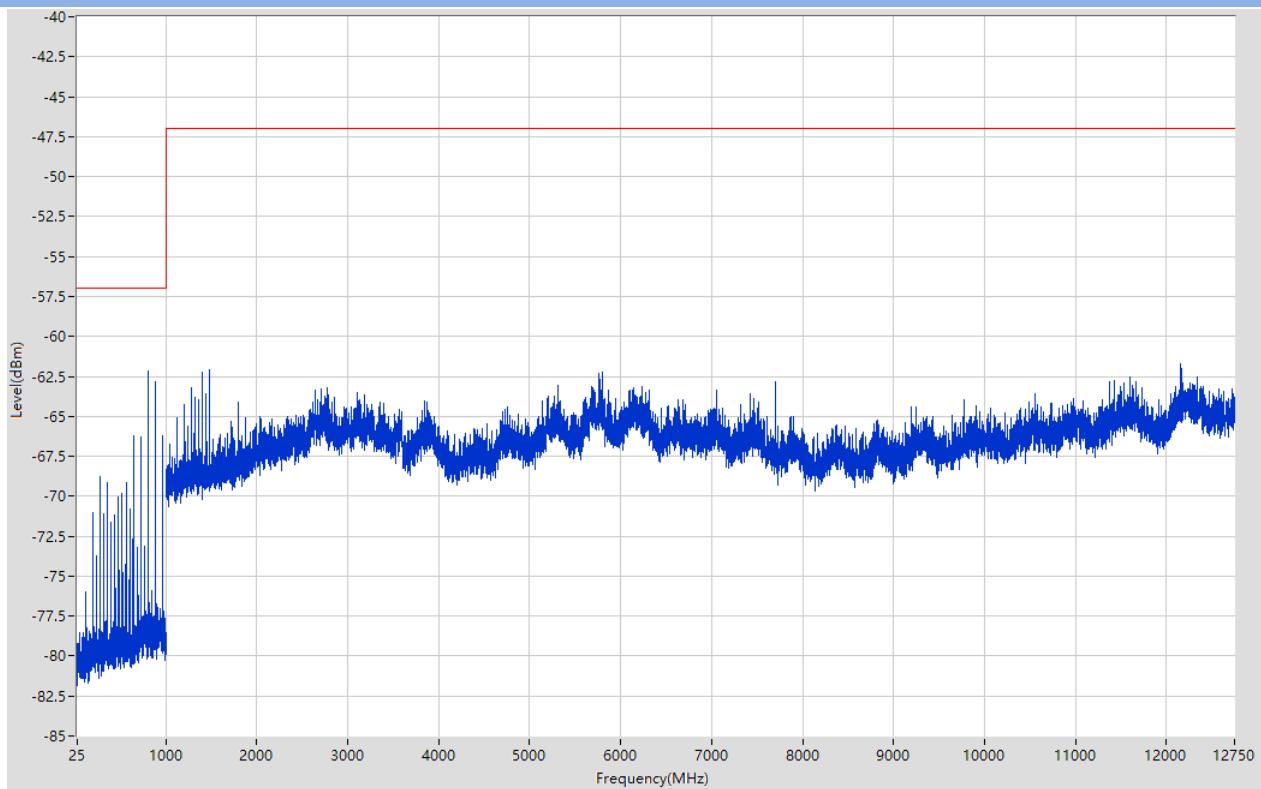
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.51	-57	N/A	1001
			RMS		-67.64		Pass	30000
1000	12750	1	Peak	12230.956	-61.92	-47	Pass	11750

802.11ac40 30 MHz to 12.75 GHz, Low Sub-band, High channel



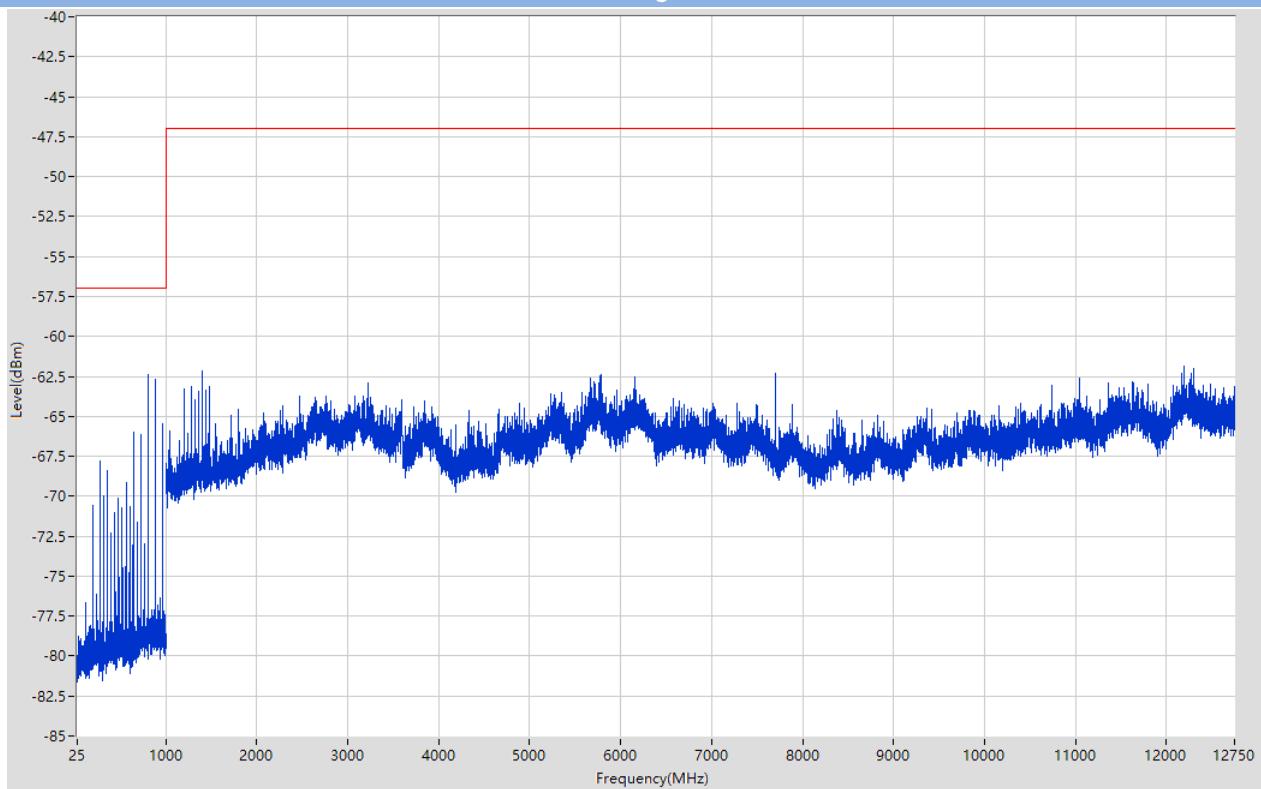
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.52	-57	N/A	1001
			RMS		-67.61		Pass	30000
1000	12750	1	Peak	12219.955	-62.2	-47	Pass	11750

802.11ac80 30 MHz to 12.75 GHz, Low Sub-band, Low channel



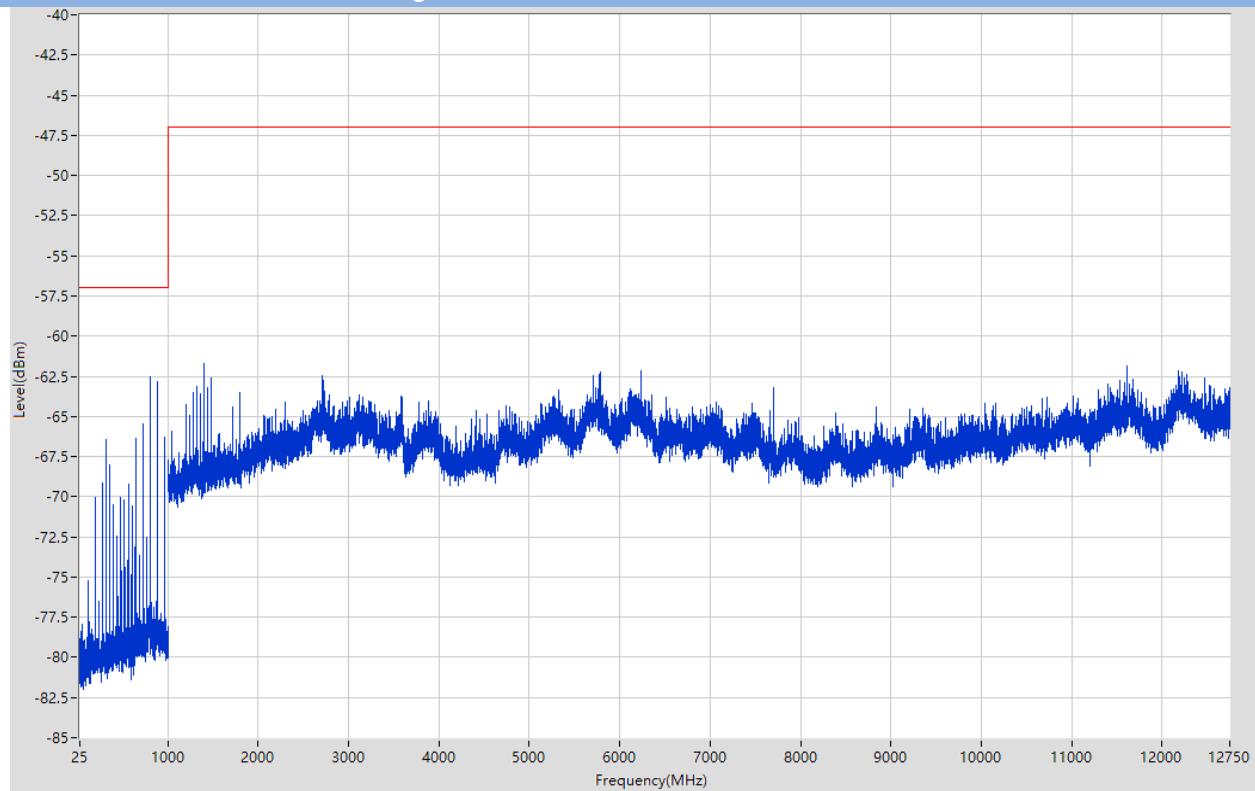
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.16	-57	N/A	1001
			RMS		-72.39		Pass	30000
1000	12750	1	Peak	12157.95	-61.68	-47	Pass	11750

802.11ac80 30 MHz to 12.75 GHz, Low Sub-band, High channel



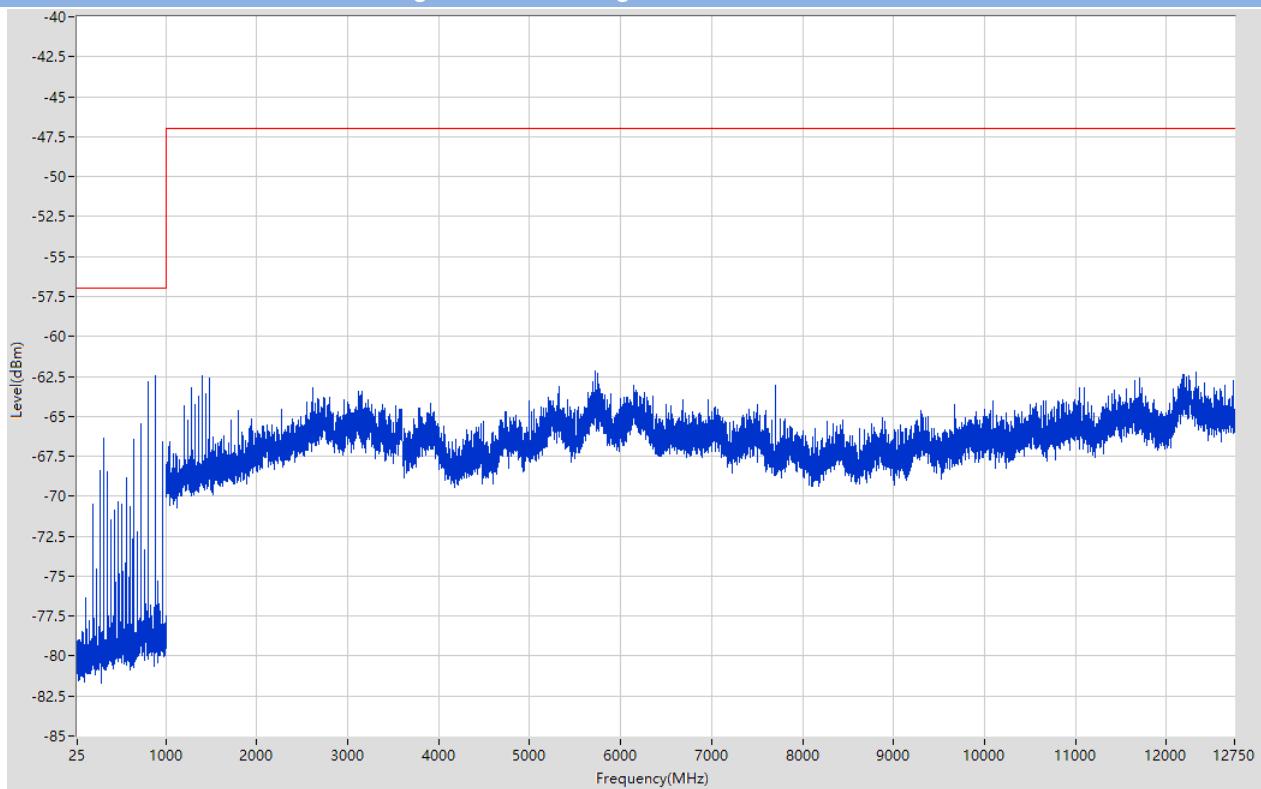
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.4	-57	N/A	1001
			RMS		-72.3		Pass	30000
1000	12750	1	Peak	12190.952	-61.83	-47	Pass	11750

802.11a 30 MHz to 12.75 GHz, High Sub-band, Low channel



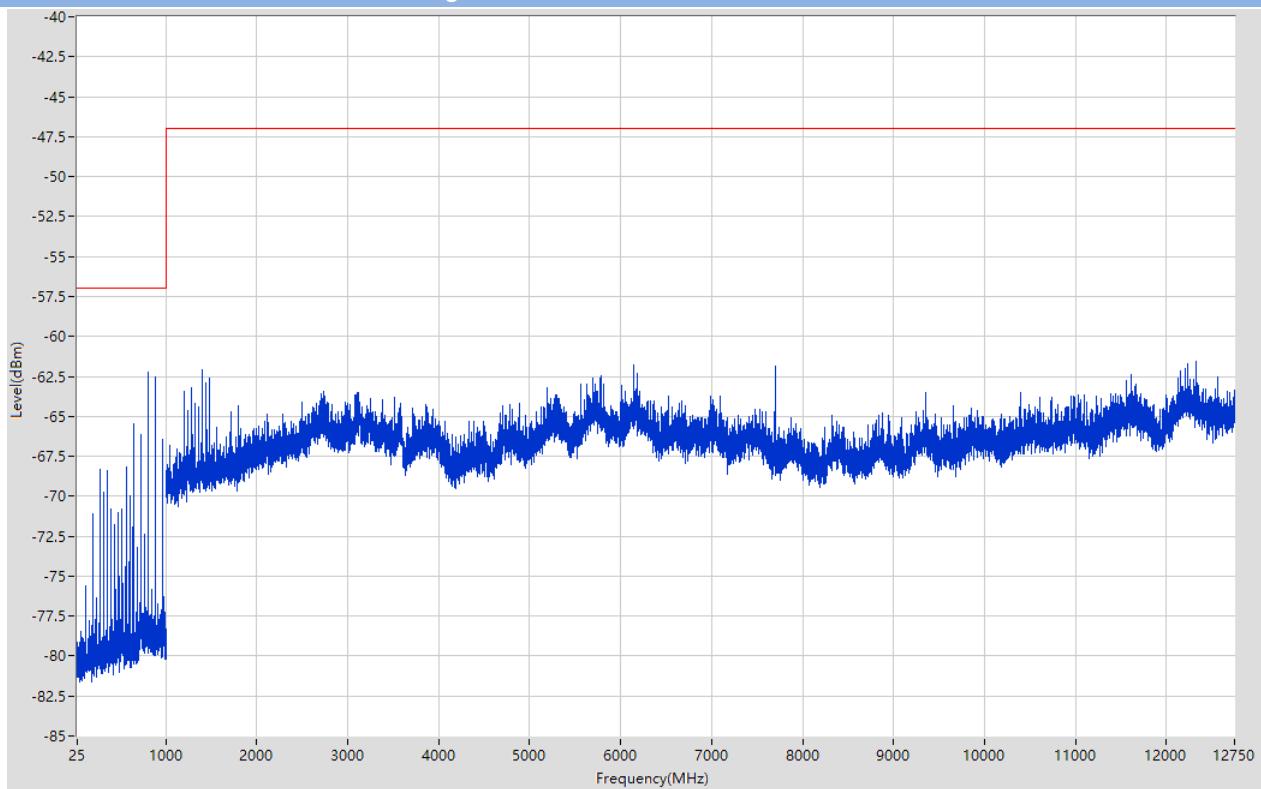
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.52	-57	N/A	1001
			RMS		-72.36		Pass	30000
1000	12750	1	Peak	1400.034	-61.72	-47	Pass	11750

802.11a 30 MHz to 12.75 GHz, High Sub-band, High channel



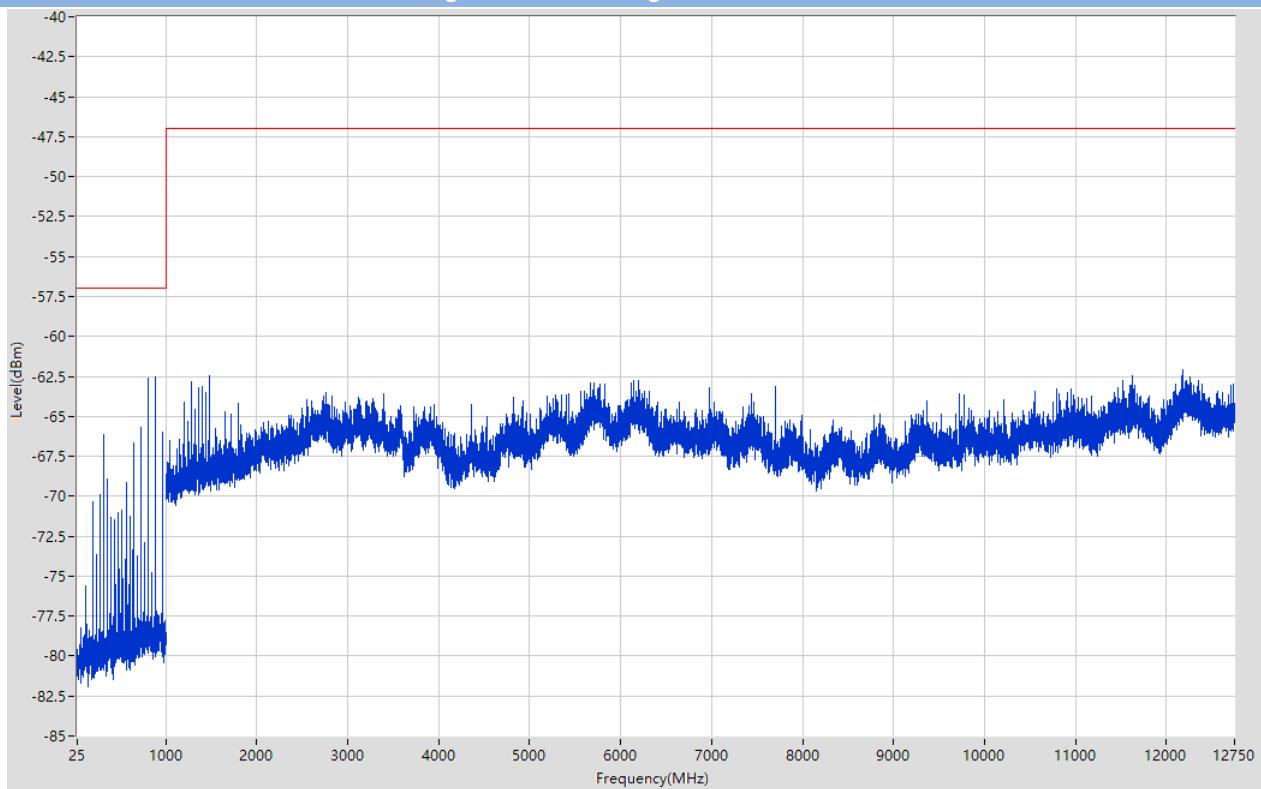
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.47	-57	N/A	1001
			RMS		-67.58		Pass	30000
1000	12750	1	Peak	5720.402	-62.15	-47	Pass	11750

802.11n20 30 MHz to 12.75 GHz, High Sub-band, Low channel



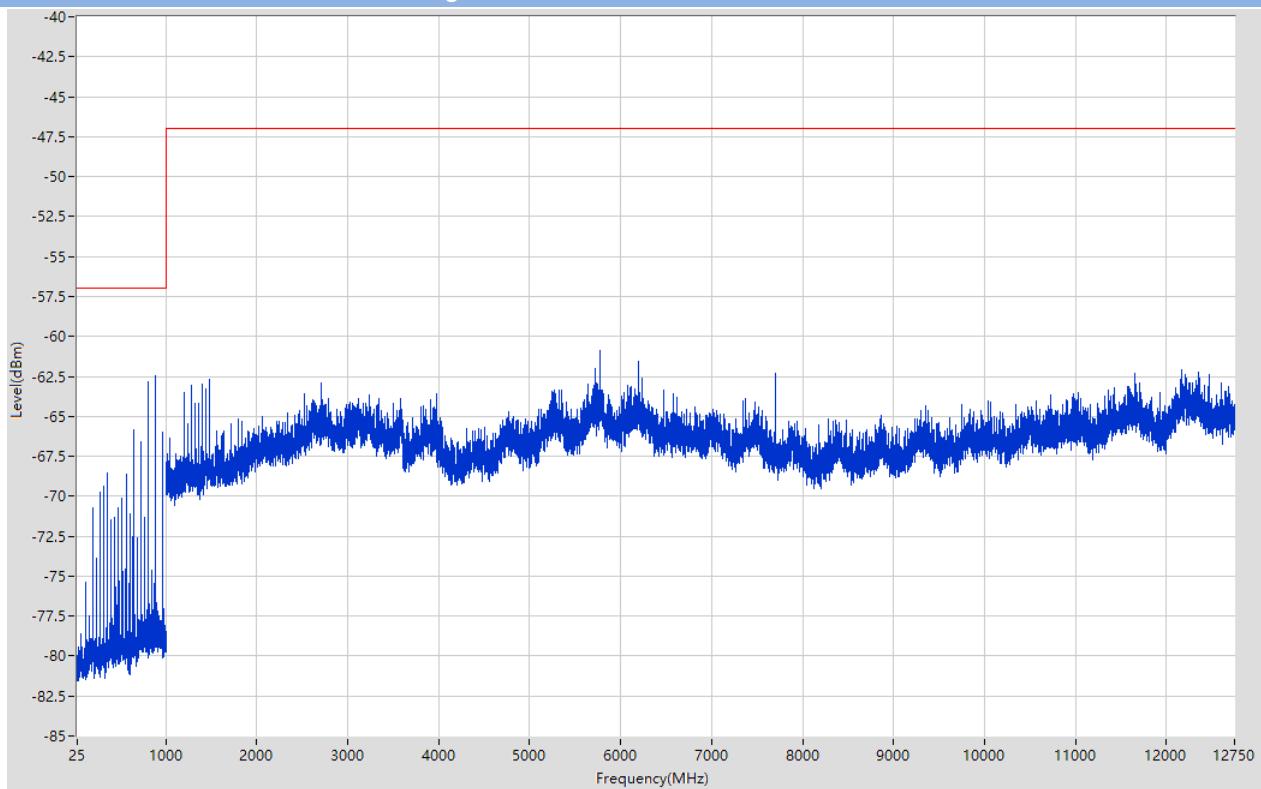
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.23	-57	N/A	1001
			RMS		-72.39		Pass	30000
1000	12750	1	Peak	12324.964	-61.56	-47	Pass	11750

802.11n20 30 MHz to 12.75 GHz, High Sub-band, High channel



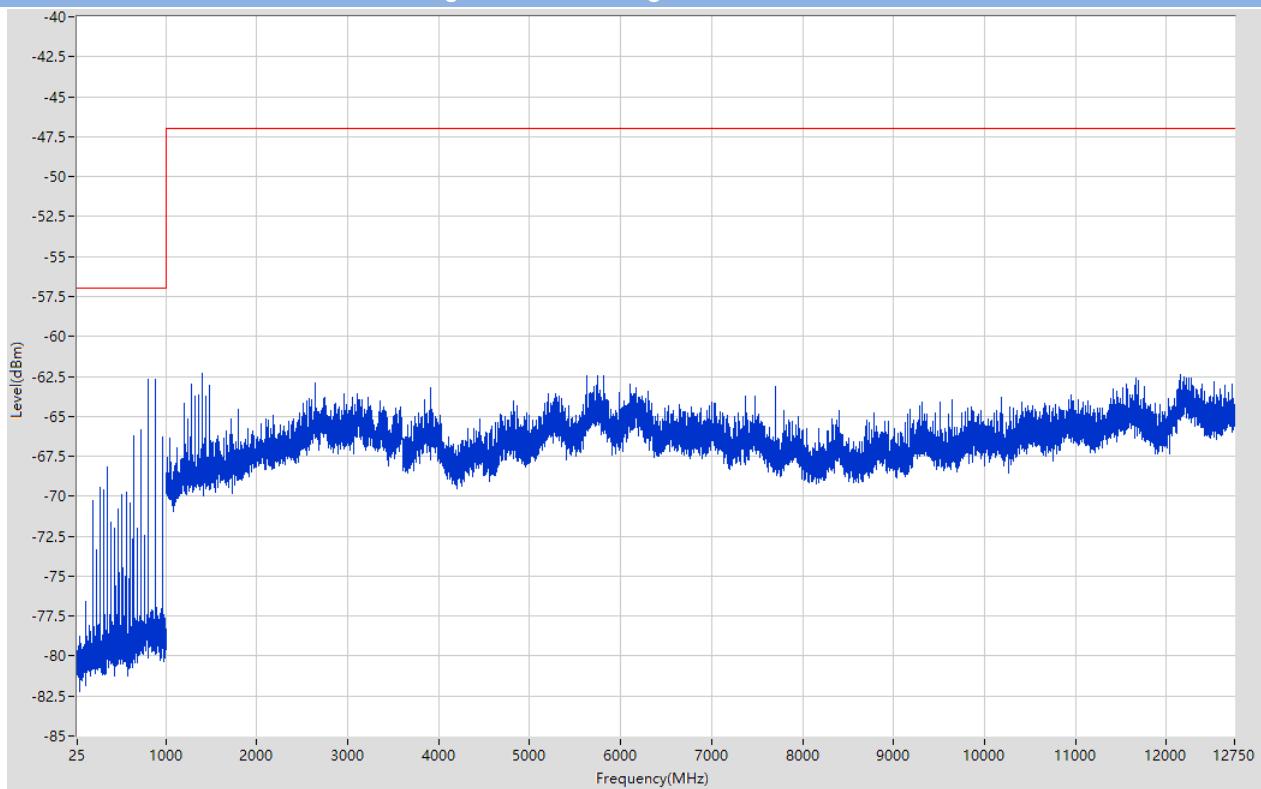
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.57	-57	N/A	1001
			RMS		-67.68		Pass	30000
1000	12750	1	Peak	12178.951	-62.09	-47	Pass	11750

802.11n40 30 MHz to 12.75 GHz, High Sub-band, Low channel



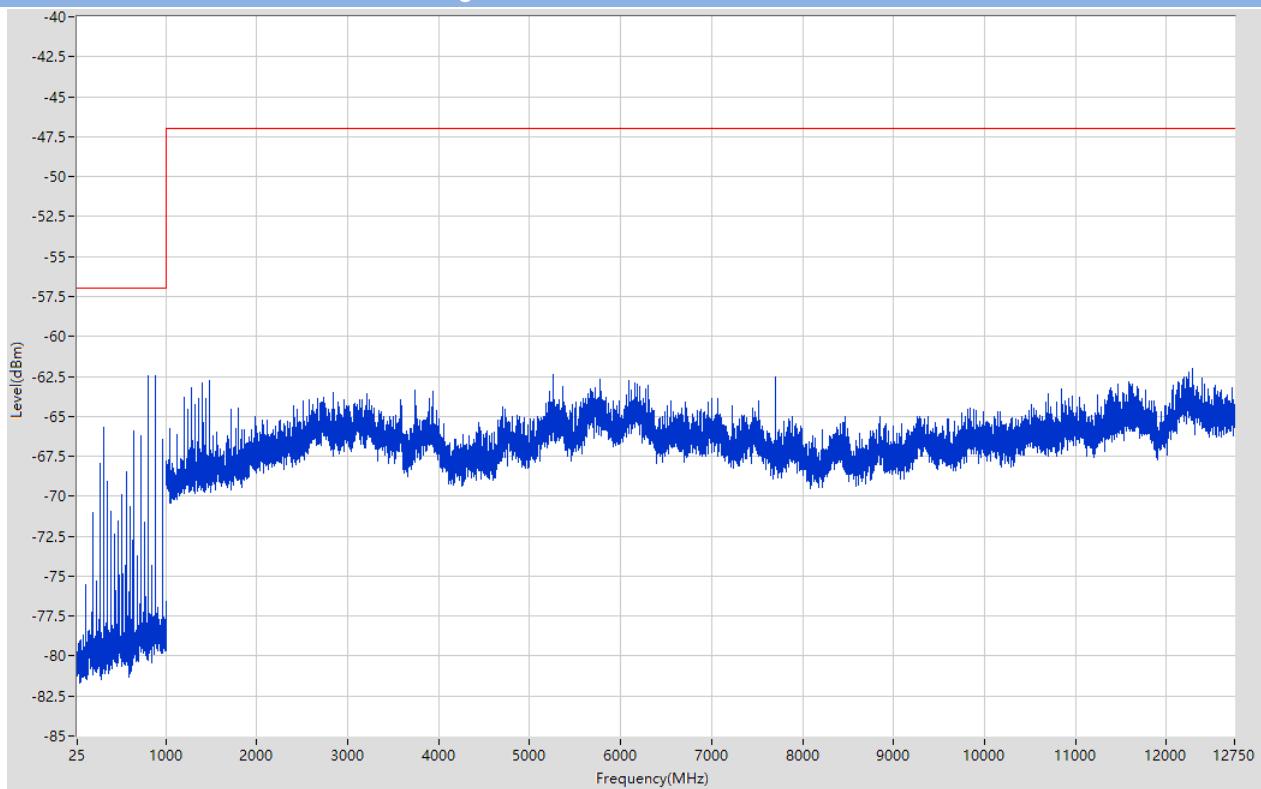
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.5	-57	N/A	1001
			RMS		-67.62		Pass	30000
1000	12750	1	Peak	5775.406	-60.88	-47	Pass	11750

802.11n40 30 MHz to 12.75 GHz, High Sub-band, High channel



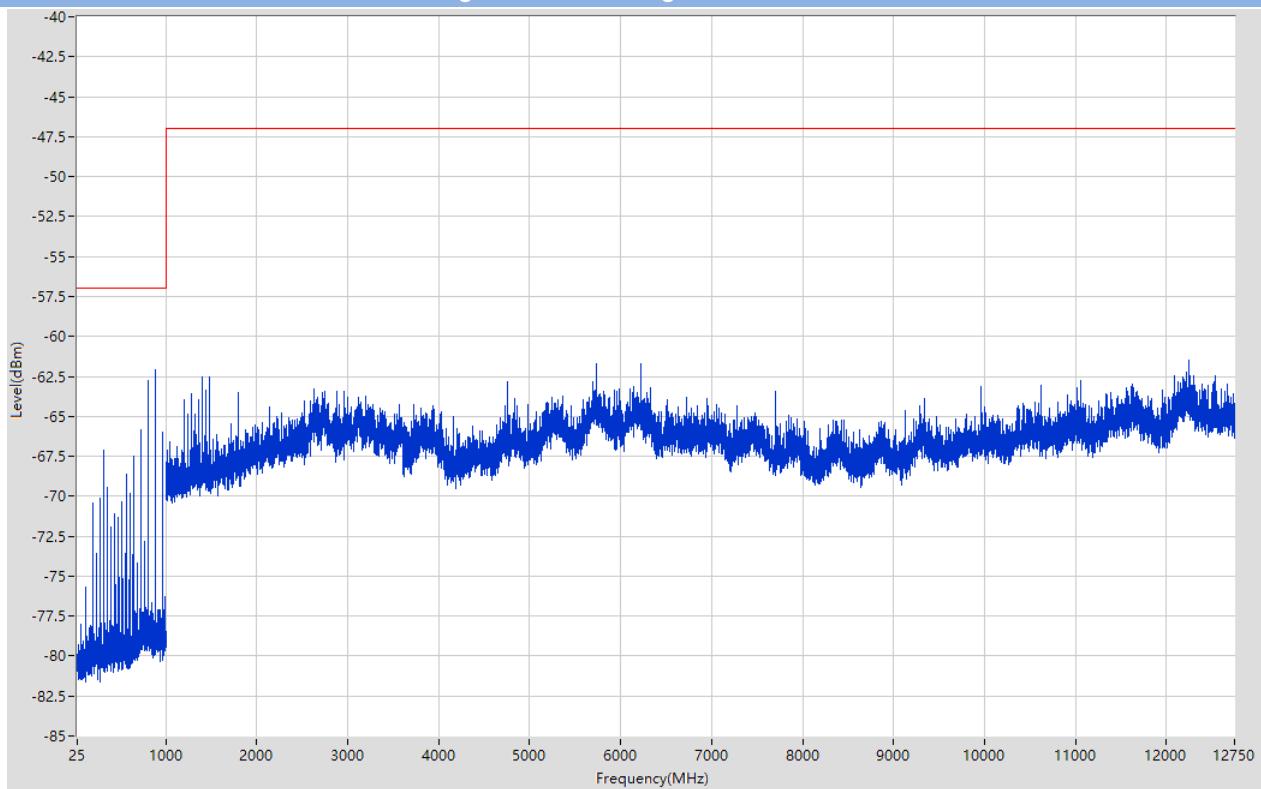
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.67	-57	N/A	1001
			RMS		-72.28		Pass	30000
1000	12750	1	Peak	1400.034	-62.35	-47	Pass	11750

802.11ac20 30 MHz to 12.75 GHz, High Sub-band, Low channel



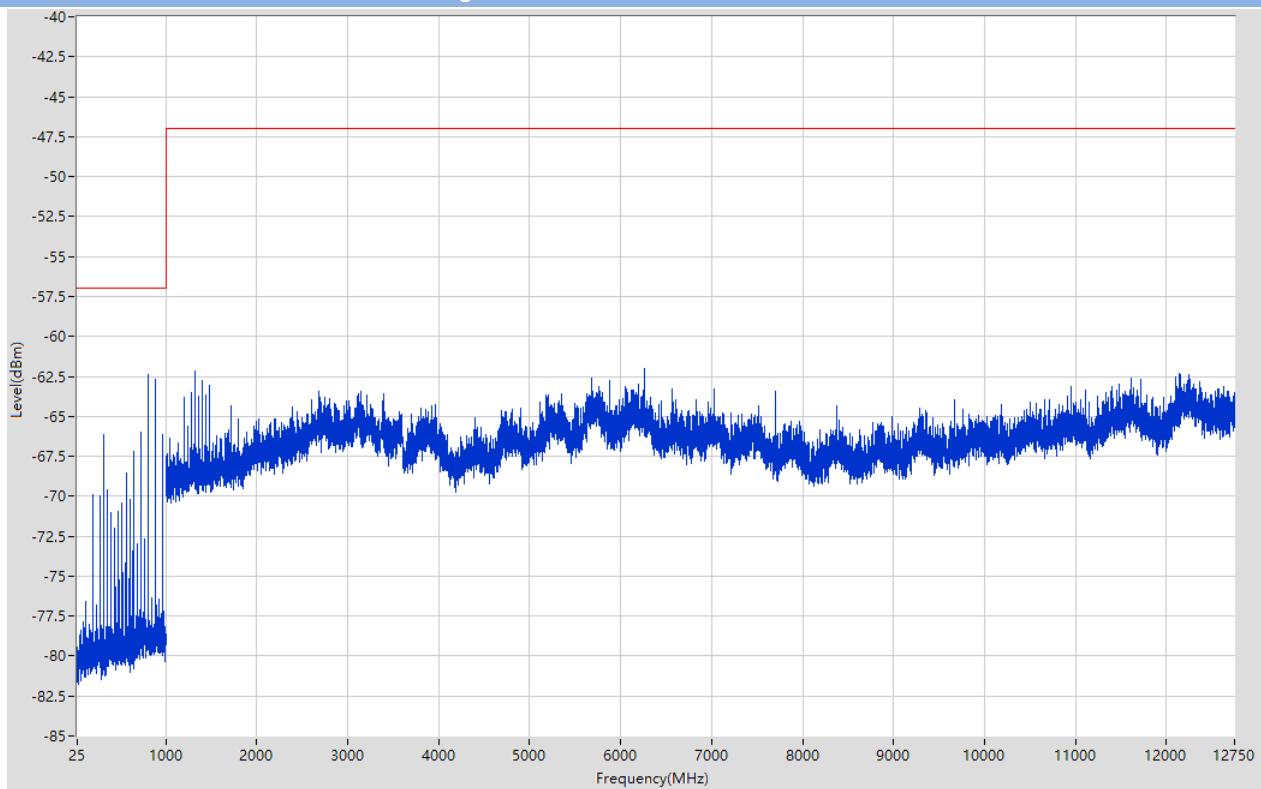
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.48	-57	N/A	1001
			RMS		-67.69		Pass	30000
1000	12750	1	Peak	12281.96	-61.99	-47	Pass	11750

802.11ac20 30 MHz to 12.75 GHz, High Sub-band, High channel



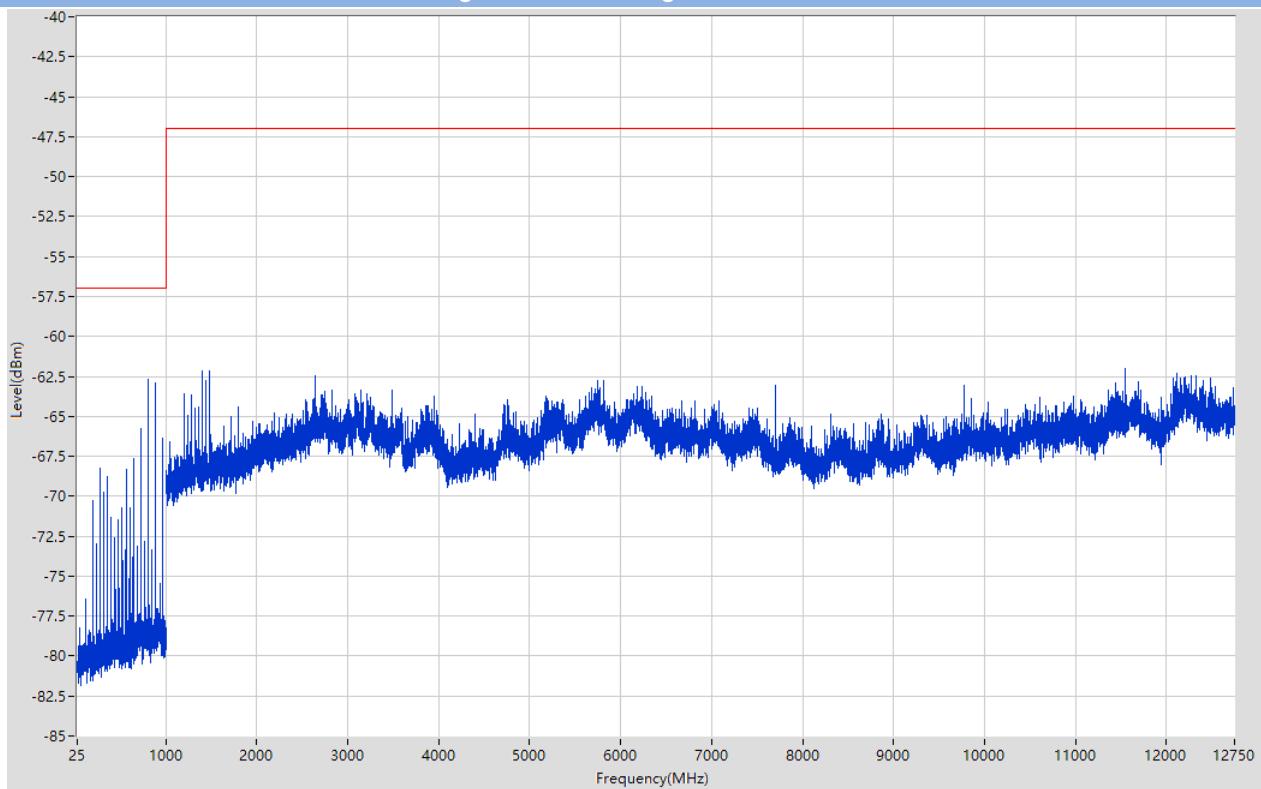
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.09	-57	N/A	1001
			RMS		-67.57		Pass	30000
1000	12750	1	Peak	12251.958	-61.48	-47	Pass	11750

802.11ac40 30 MHz to 12.75 GHz, High Sub-band, Low channel



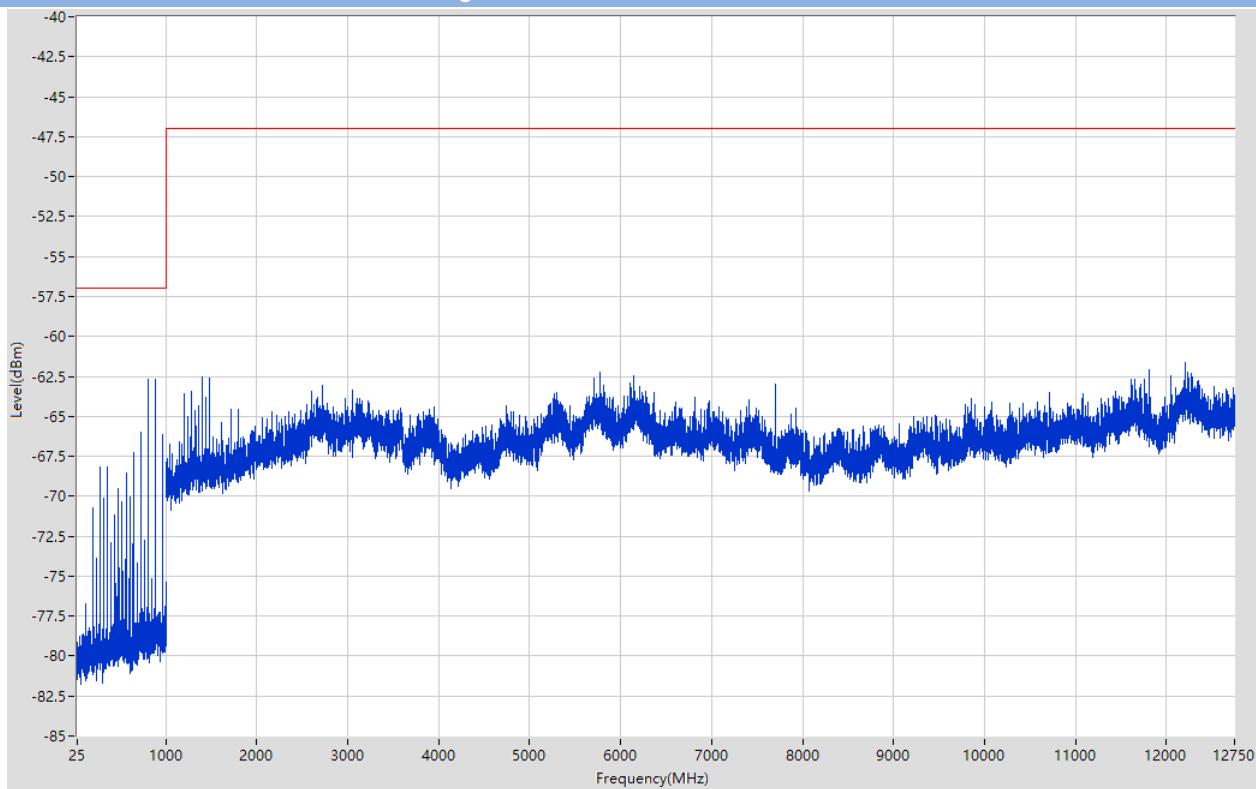
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.35	-57	N/A	1001
			RMS		-72.34		Pass	30000
1000	12750	1	Peak	6263.448	-61.99	-47	Pass	11750

802.11ac40 30 MHz to 12.75 GHz, High Sub-band, High channel



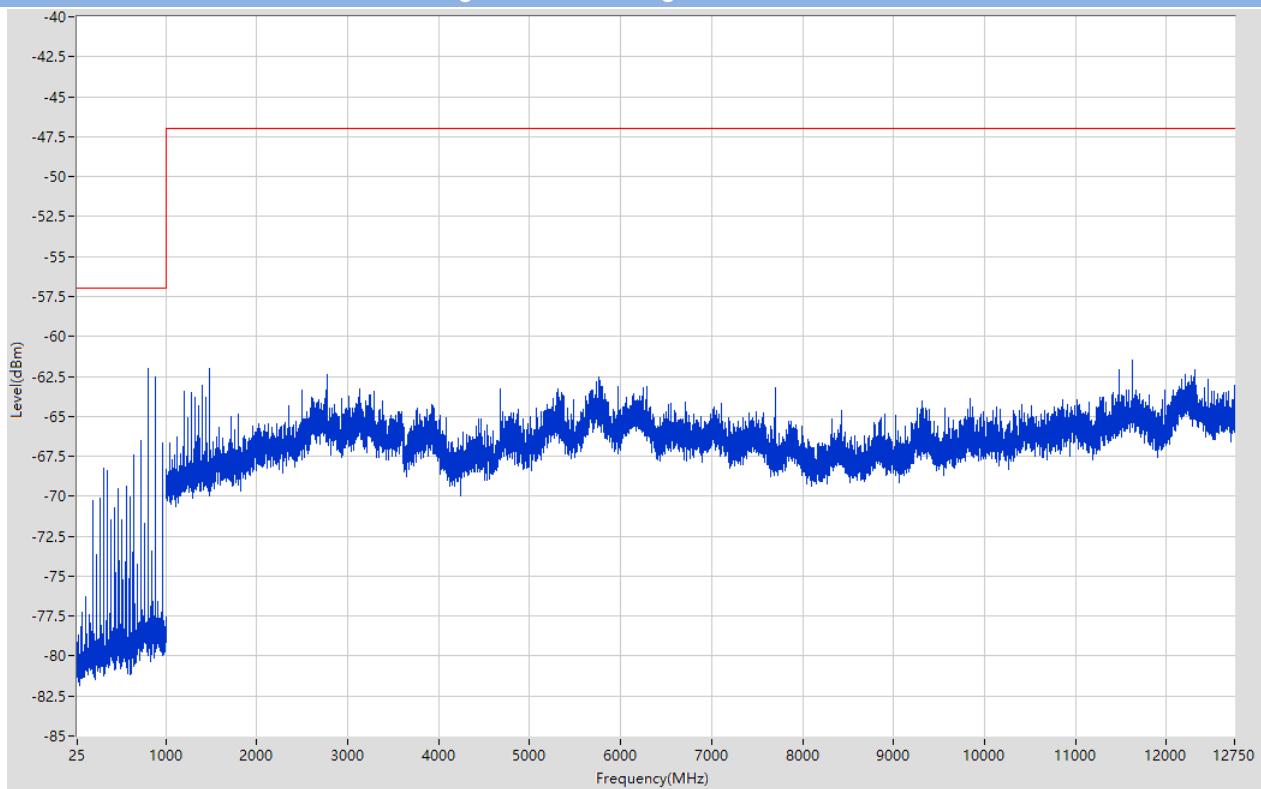
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.71	-57	N/A	1001
			RMS		-72.43		Pass	30000
1000	12750	1	Peak	11547.898	-62.01	-47	Pass	11750

802.11ac80 30 MHz to 12.75 GHz, High Sub-band, Low channel



Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	880.075	-62.69	-57	N/A	1001
			RMS		-67.65		Pass	30000
1000	12750	1	Peak	12202.953	-61.63	-47	Pass	11750

802.11ac80 30 MHz to 12.75 GHz, High Sub-band, High channel



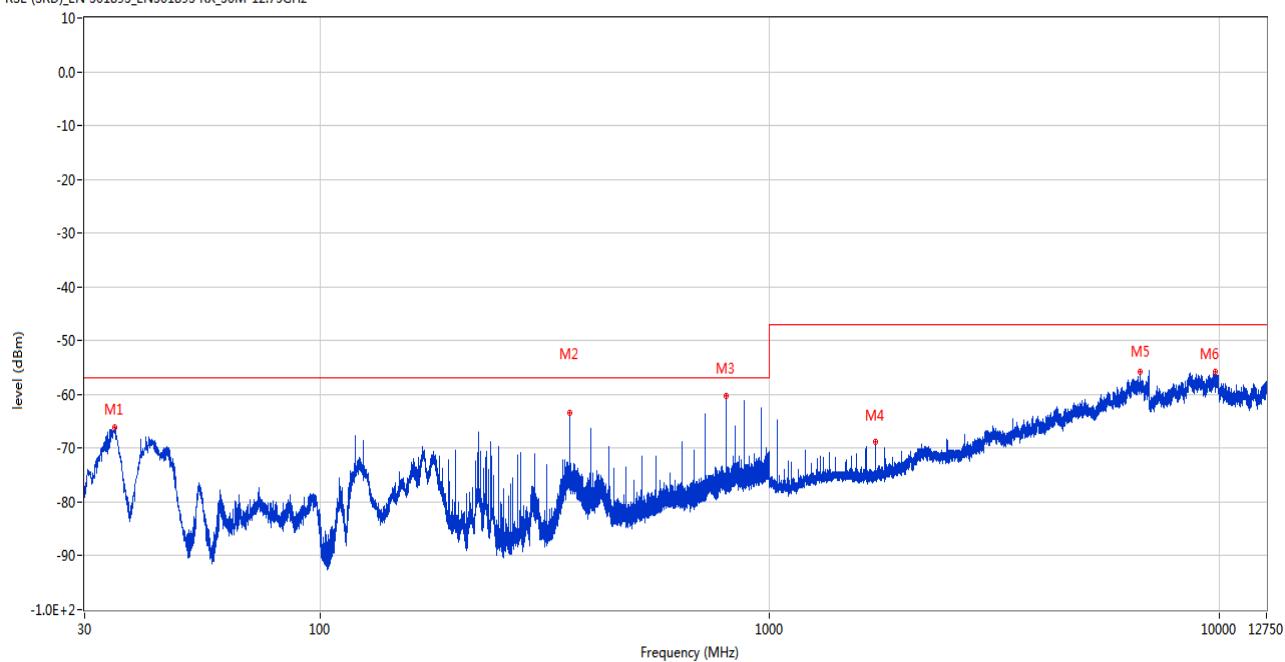
Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
25	1000	0.1	Peak	800.125	-62.04	-57	N/A	1001
			RMS		-72.45		Pass	30000
1000	12750	1	Peak	11630.905	-61.47	-47	Pass	11750

Note: The spurious above 12.75G is noise only, do not show on the report.

Cabinet Radiation Test Data

30 MHz to 12.75 GHz, ANT V

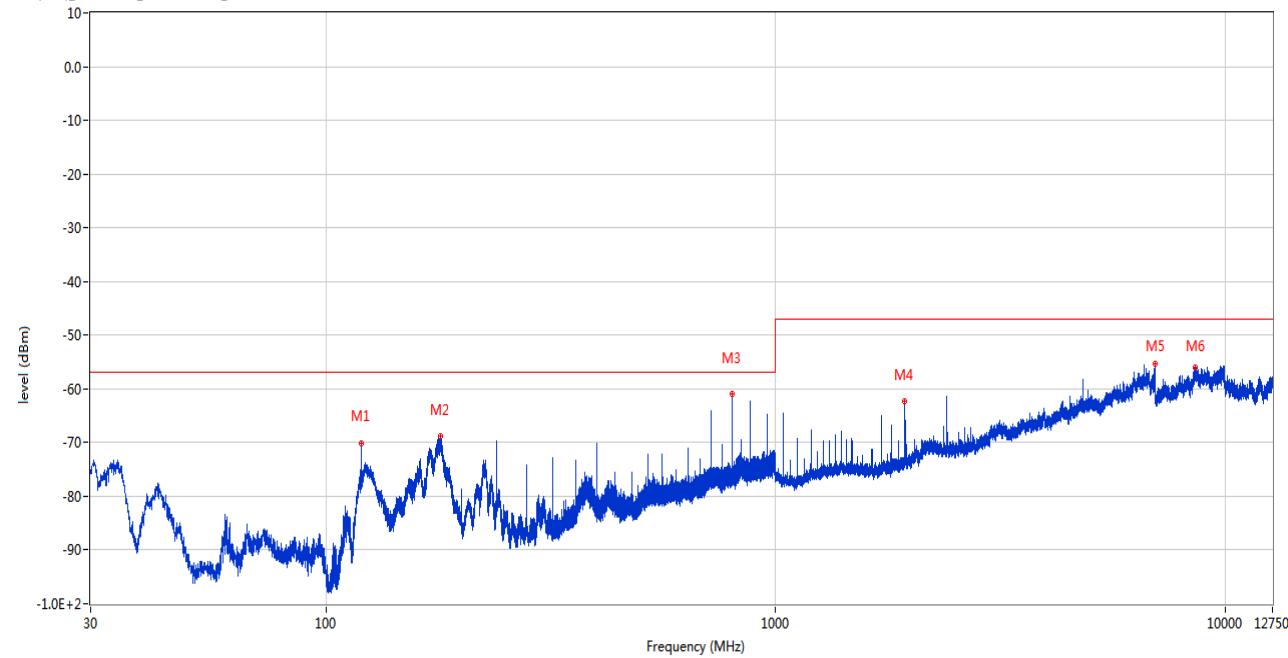
RSE (SRD)_EN 301893_EN301893 RX_30M-12.75GHz



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
34.947	-66.19	-18.62	-57.0	-9.19	140.00	Vertical	Horizontal	Pass
360.042	-63.32	-10.31	-57.0	-6.32	88.00	Vertical	Horizontal	Pass
800.034	-60.27	2.02	-57.0	-3.27	160.00	Vertical	Horizontal	Pass
1720.200	-64.80	-14.76	-47.0	-17.80	129.00	Vertical	Horizontal	Pass
6683.200	-55.87	4.14	-47.0	-8.87	5.00	Vertical	Horizontal	Pass
9822.963	-55.68	7.57	-47.0	-8.68	114.00	Vertical	Horizontal	Pass

30 MHz to 12.75 GHz, ANT H

RSE (SRD)_EN 301893_EN301893 RX_30M-12.75GHz



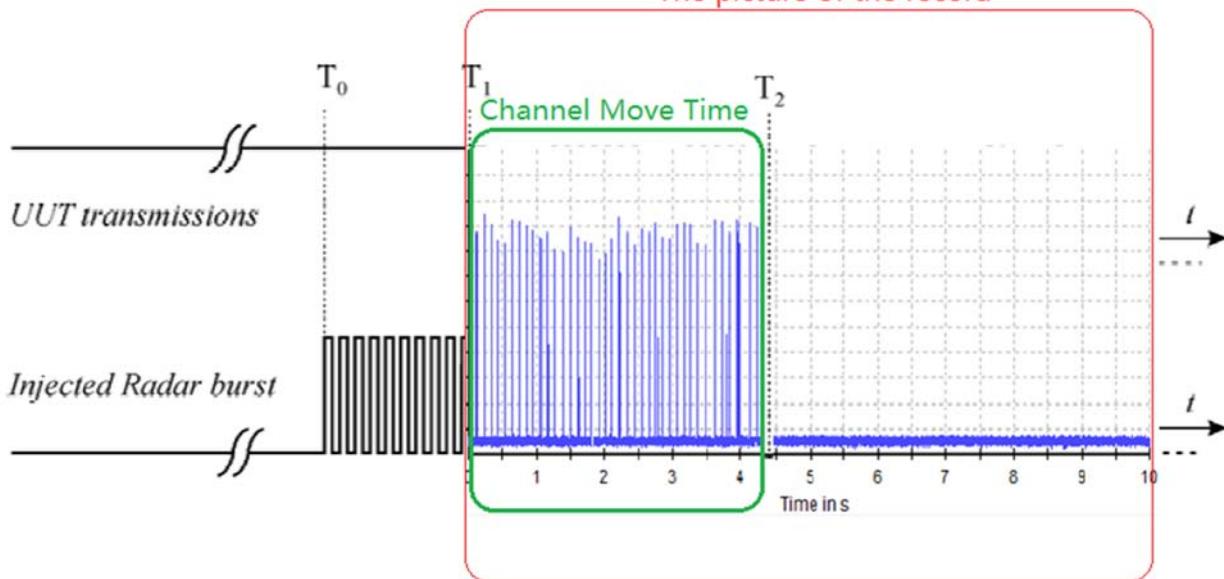
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Over Limit (dB)	Table (o)	ANT	EUT	Verdict
120.016	-70.08	-19.50	-57.0	-13.08	300.00	Horizontal	Horizontal	Pass
179.526	-68.83	-13.97	-57.0	-11.83	93.00	Horizontal	Horizontal	Pass
800.034	-60.89	2.02	-57.0	-3.89	143.00	Horizontal	Horizontal	Pass
1941.900	-62.34	-13.42	-47.0	-15.34	77.00	Horizontal	Horizontal	Pass
6998.600	-55.39	5.92	-47.0	-8.39	83.00	Horizontal	Horizontal	Pass
8603.675	-56.02	5.88	-47.0	-9.02	121.00	Horizontal	Horizontal	Pass

A.8 Dynamic Frequency Selection (DFS)

List of Measurements

Test Method	Standard Rule	Description	Test Result	Verdict
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	4.7.2.2	Channel Availability Check	Not Applicable	N/A
	4.7.2.3	Off-Channel CAC (see note 1)	Not Applicable	N/A
	4.7.2.4	In-Service Monitoring	Not Applicable	N/A
	4.7.2.5	Channel Shutdown	Applicable	Pass
	4.7.2.6	Non-Occupancy Period	Not Applicable	N/A
	4.7.2.7	Uniform Spreading	Not Applicable	N/A

The picture of the record



T_0 denotes DFS test signal start generated on the channel.

T_1 denotes the end of the radar burst.

T_2 denotes the instant when the UUT has ceased all transmissions on the channel.

The time difference between T_1 and T_2 shall be measured. This value (*Channel Move Time*) shall be noted and compared with the limit.

The aggregate duration (*Channel Closing Transmission Time*) of all transmissions from the UUT on Ch_r during the *Channel Move Time* shall be compared to the limit.

DFS Test schematic graphic

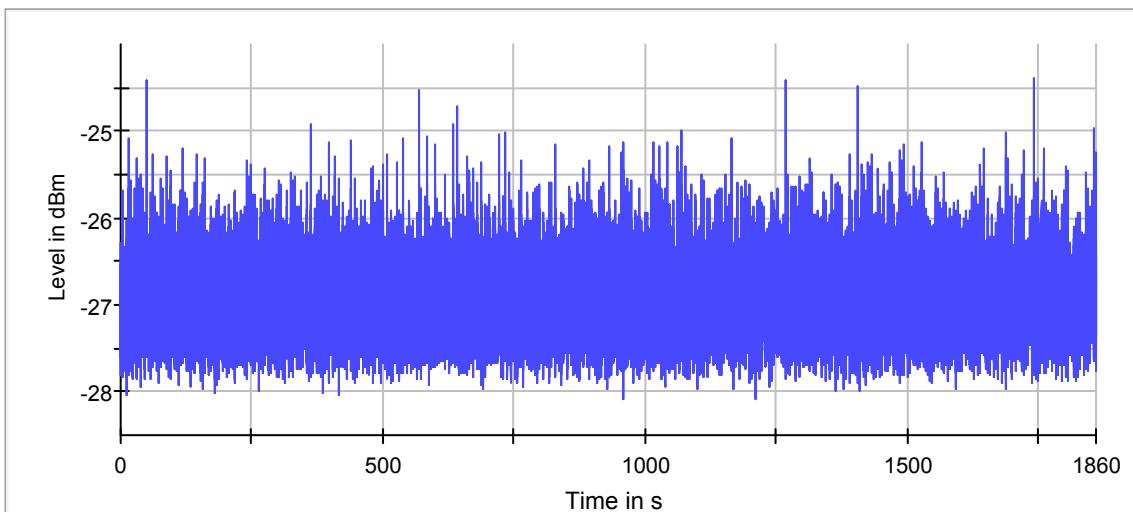
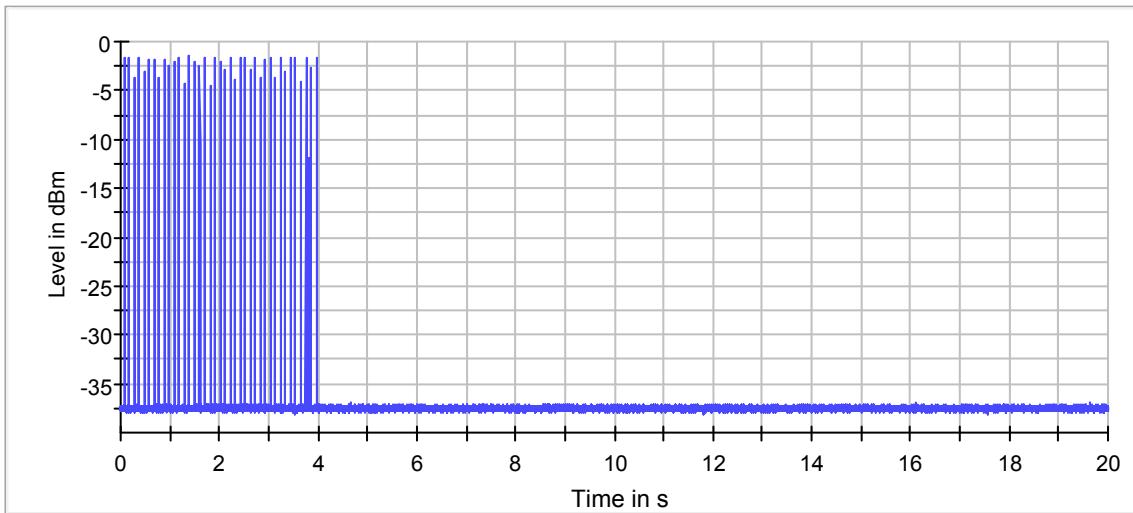
Note: The radar test signals are injected into the Master Device.

This test was investigated for different bandwidth (the lowest and the highest bandwidth).

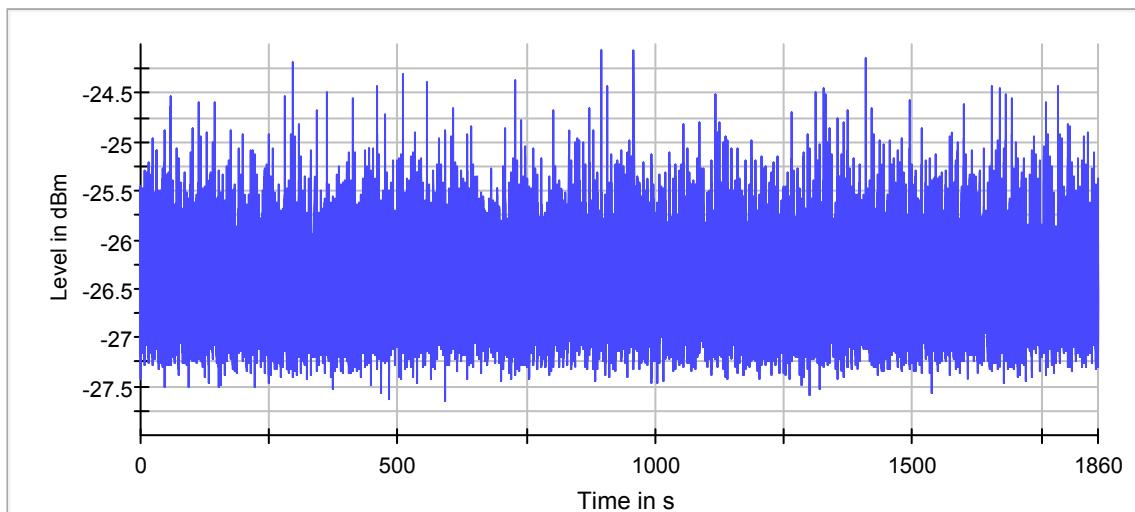
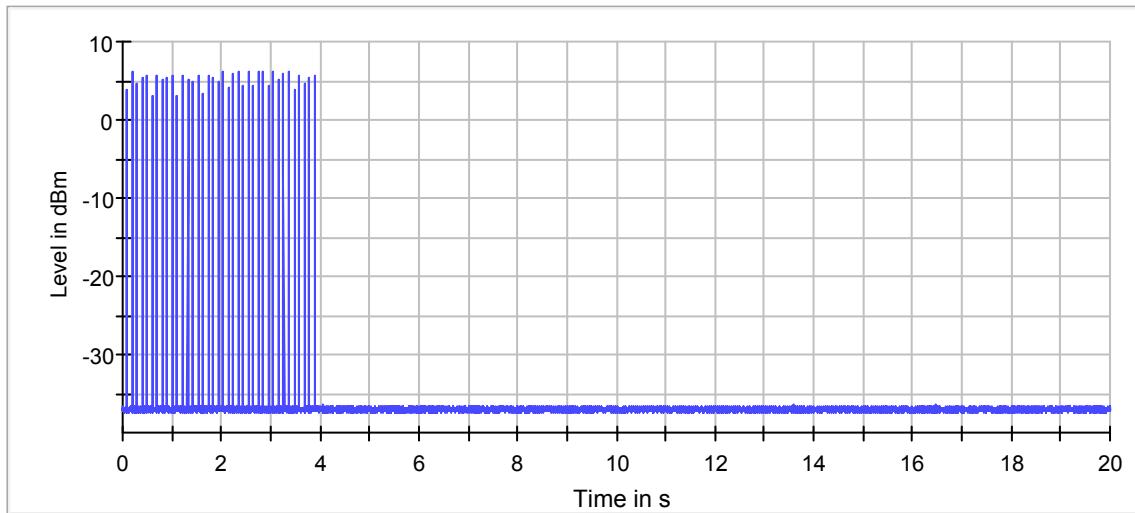
Result of Measurements

Description	Operation Mode	Operation Channel	Value (s)	Limit
Channel Move Time	802.11a	52	3.982	10 s
Channel Closing Transmission Time	802.11a	52	0.039	1 s
Channel Move Time	802.11a	100	3.841	10 s
Channel Closing Transmission Time	802.11a	100	0.040	1 s
Channel Move Time	802.11ac(80 MHz)	58	3.648	10 s
Channel Closing Transmission Time	802.11ac(80 MHz)	58	0.036	1 s
Channel Move Time	802.11ac(80 MHz)	106	3.725	10 s
Channel Closing Transmission Time	802.11ac(80 MHz)	106	0.037	1 s
Test Verdict	Pass			

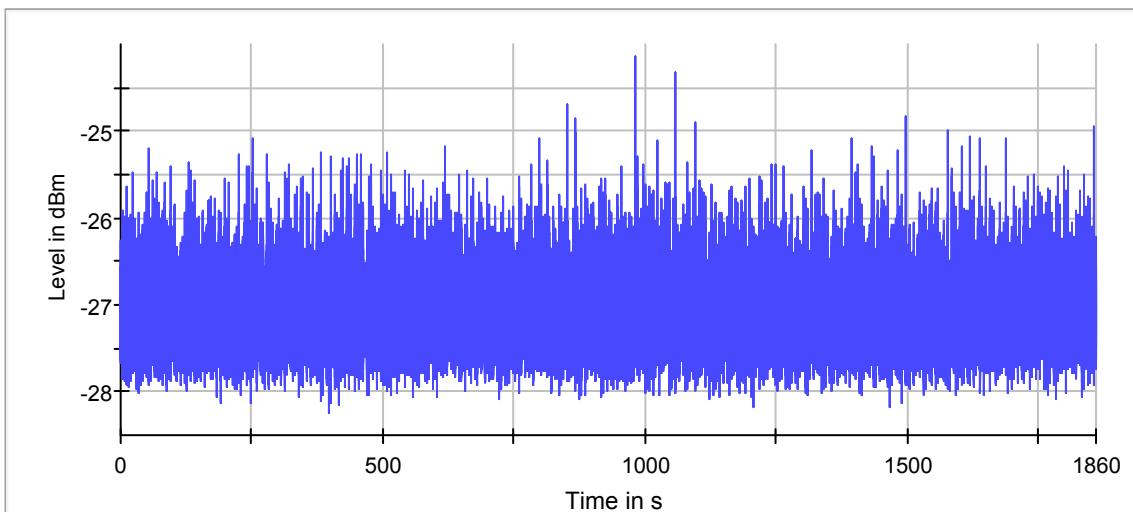
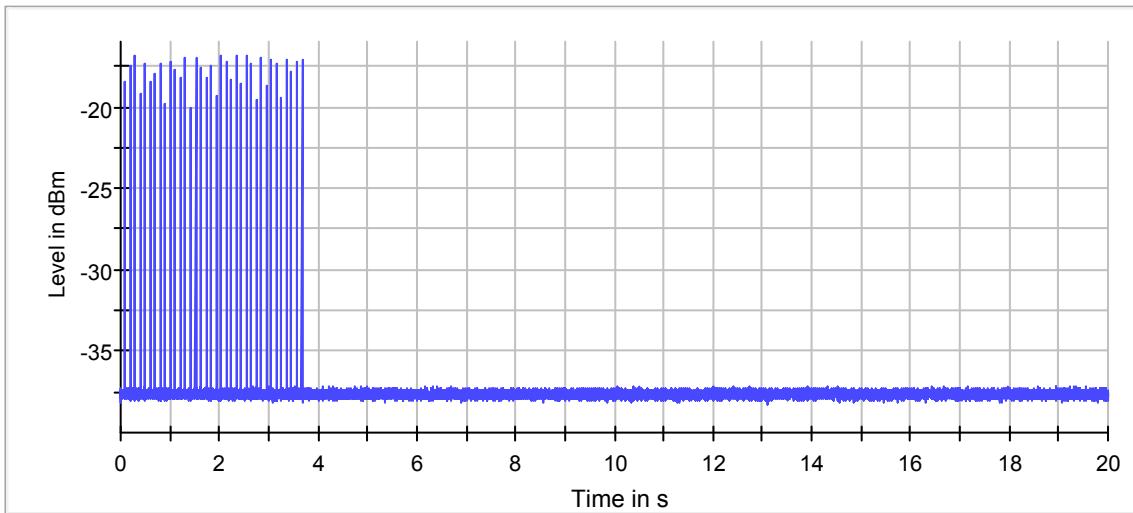
802.11a Channel 52



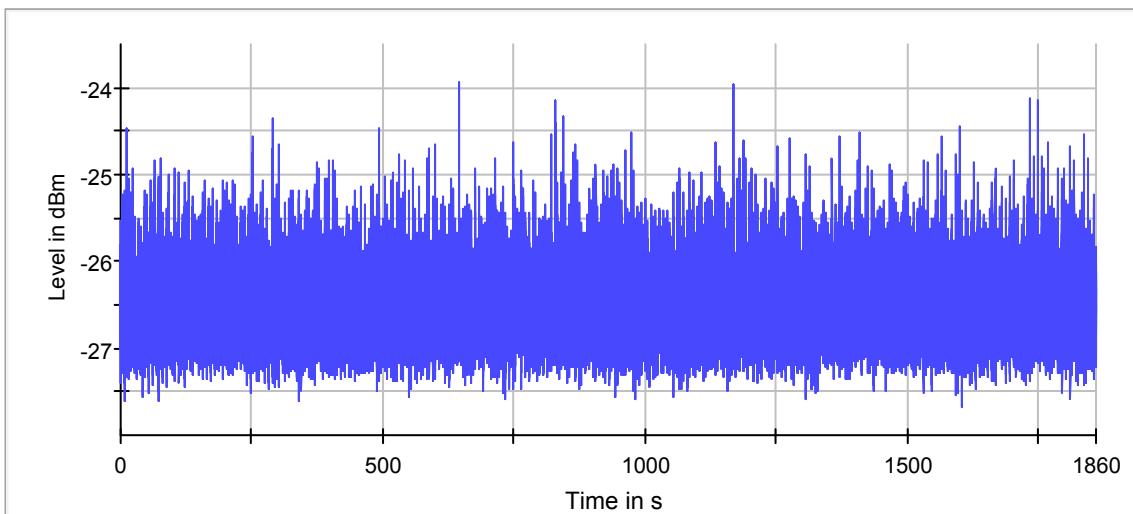
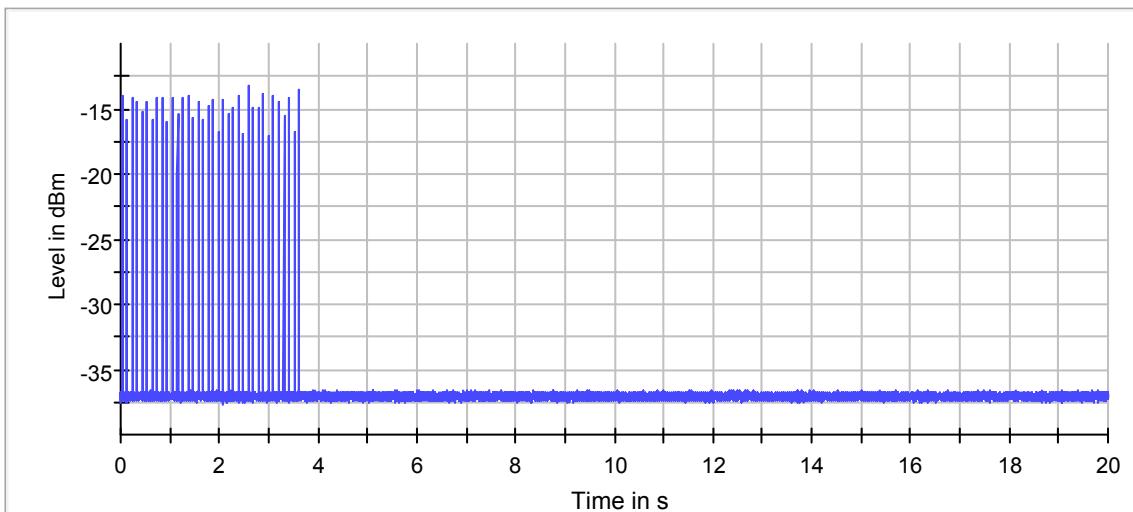
802.11a Channel 100



802.11ac(80 MHz) Channel 58



802.11ac(80 MHz) Channel 106



A.9 Adaptivity (Channel Access Mechanism)

Note 1: Manufacturers declare channel access mechanisms to be compliant.

List of Measurements

UUT Operational Mode		
Pulse width W [μ s]	Pulse repetition frequency PRF [PPS]	Pulses per burst [PPB]
--	✓	--

Test Method	Clause	Test Parameter	Remarks	Pass/Fail
<input type="checkbox"/> Radiated <input checked="" type="checkbox"/> Conducted	4.8.3.1	Adaptive (Frame Based Equipment)	Not Applicable	N/A
	4.8.3.2	Adaptive (Load Based Equipment)	Applicable	Pass
	4.8.3.3	Short Control Signaling Transmissions	Applicable	Pass

Interference Signals used for Adaptively Tests

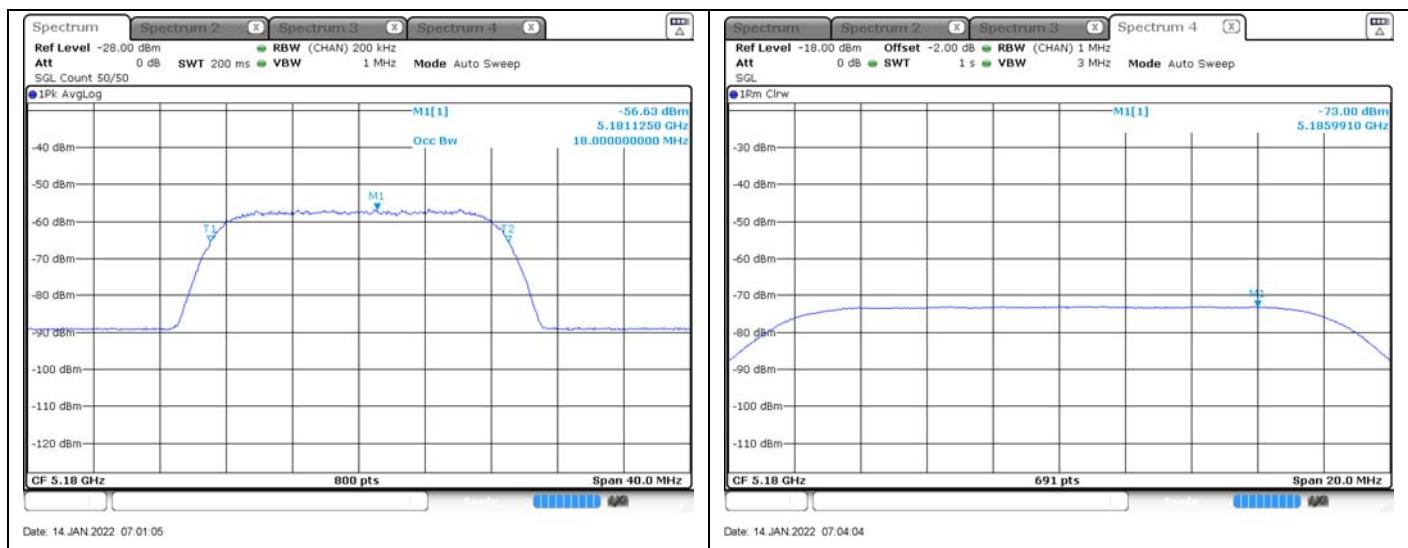
Interference Signals Type	Bandwidth (MHz)	Descriptions
AWGN	20	Note 1
OFDM	20	
LTE	20	

Note 1: The three interference signals was tested, only the worst result of interference signal (AWGN) was shown in the test report.

Energy Detection Threshold Level (TL)

Type of equipment	Interference threshold level
<input checked="" type="checkbox"/> Option 1 <input type="checkbox"/> Option 2	The ED Threshold level (TL) = -75 dBm/MHz (assumes a 0 dBi receive antenna) and maximum antenna gain is 2.0 dBi. The ED Threshold level (TL) = -75 dBm/MHz + G (2.0 dBi) = -73.0 dBm/MHz

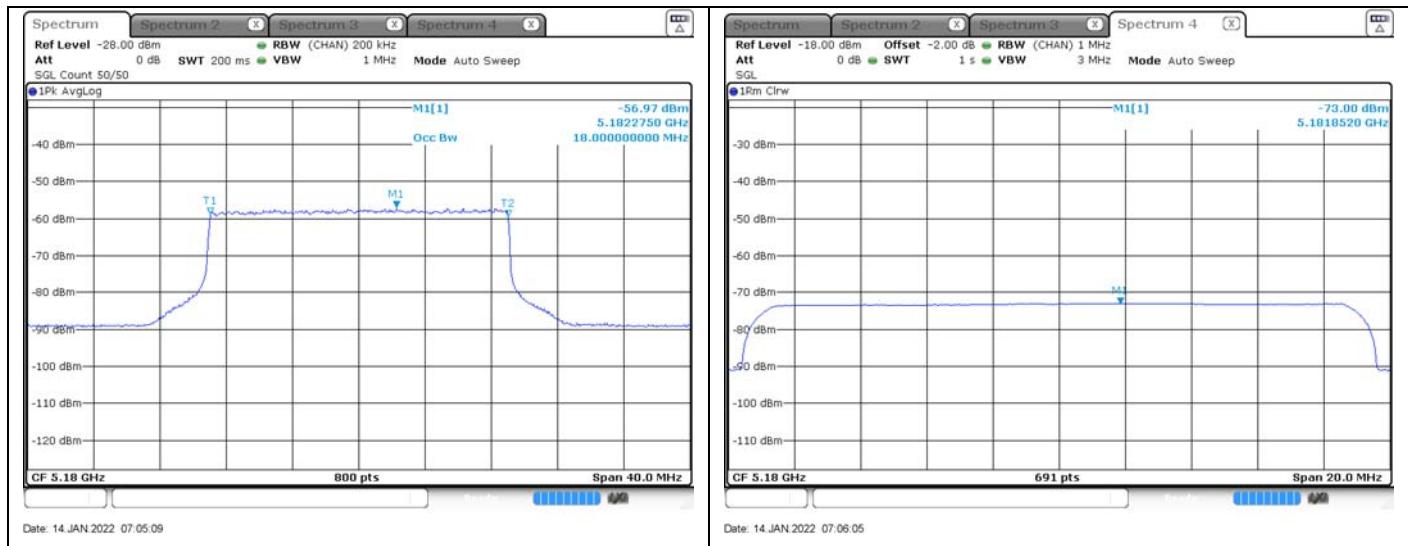
AWGN Signal



OFDM Signal

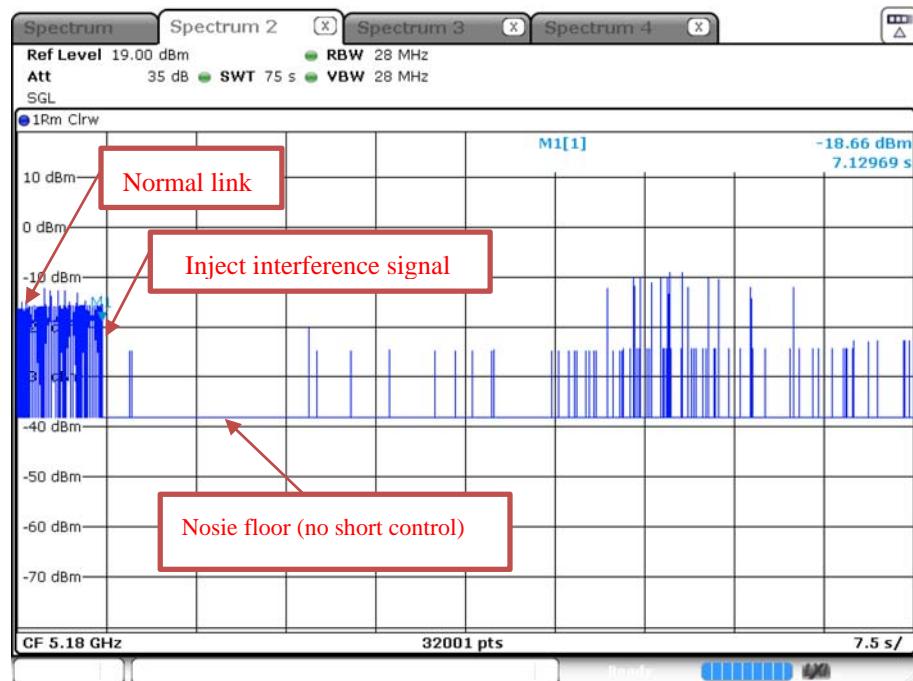


LTE Signal



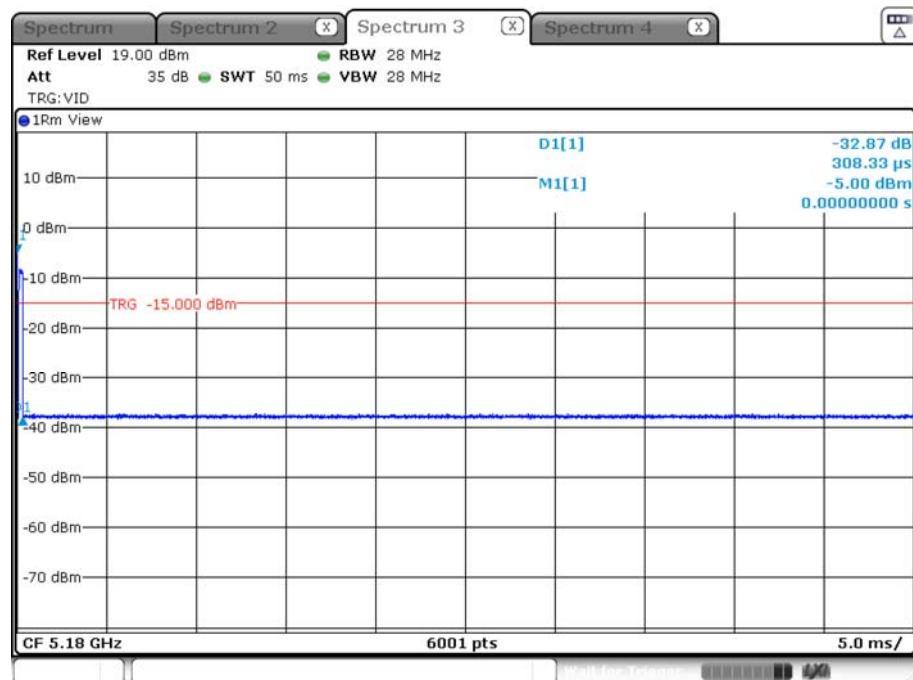
Channel shut down

802.11ac(20 MHz) Channel 36 AWGN



Date: 14.JAN.2022 07:29:18

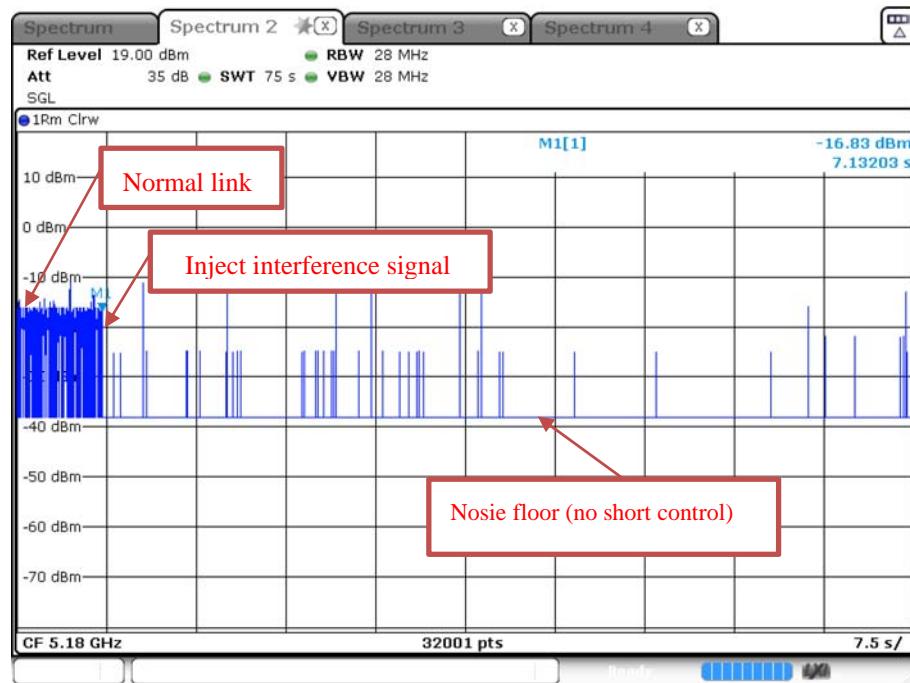
802.11ac(20 MHz) Channel 36 AWGN short control signal



Date: 14.JAN.2022 07:31:02

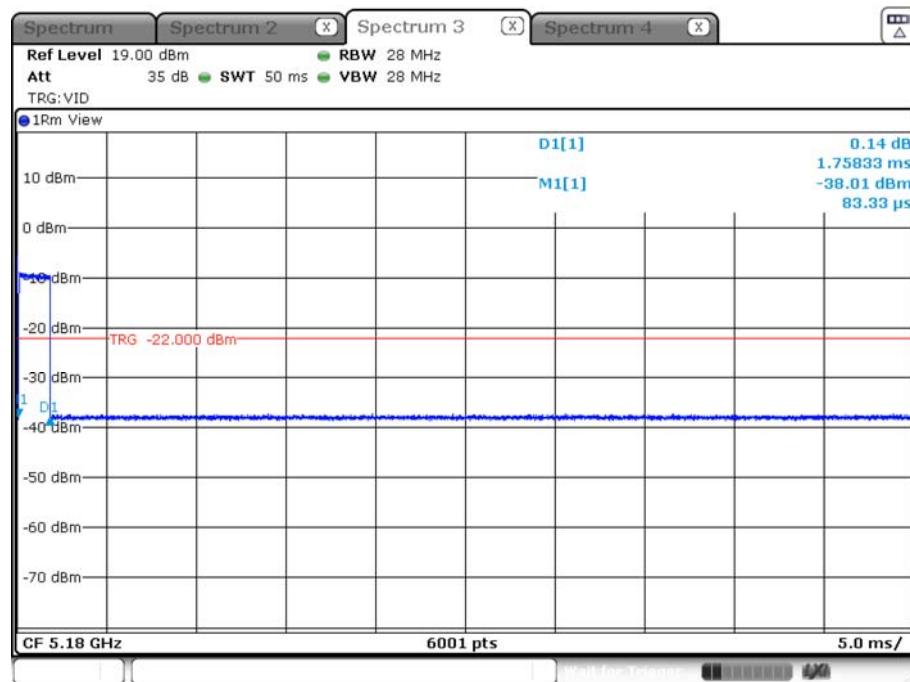
The short control signal is 0.30833ms<2.5ms, Pass.

802.11ac(20 MHz) Channel 36 OFDM



Date: 14.JAN.2022 07:40:28

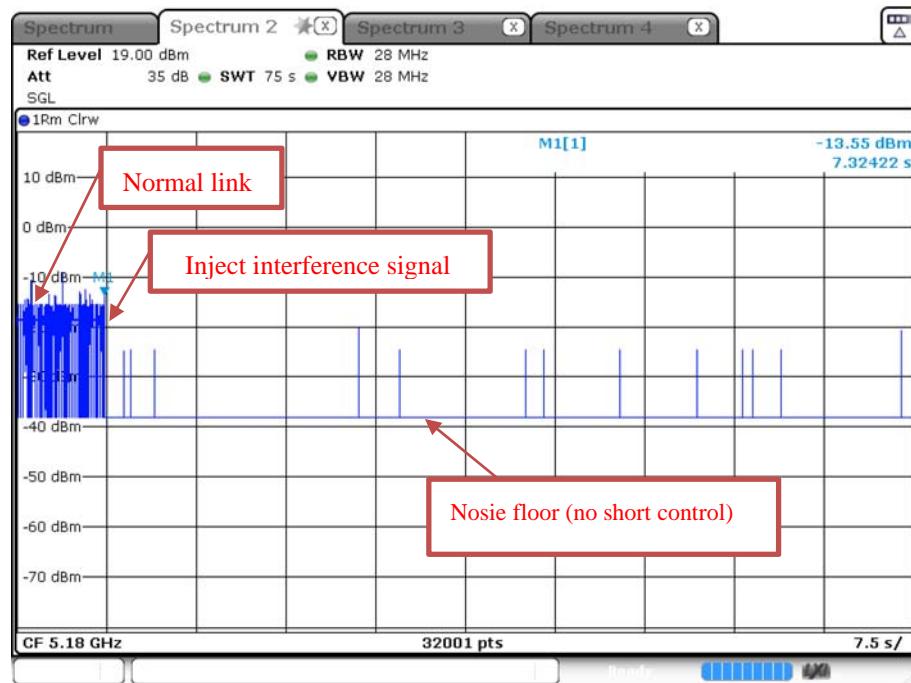
802.11ac(20 MHz) Channel 36 OFDM short control signal



Date: 14.JAN.2022 07:41:14

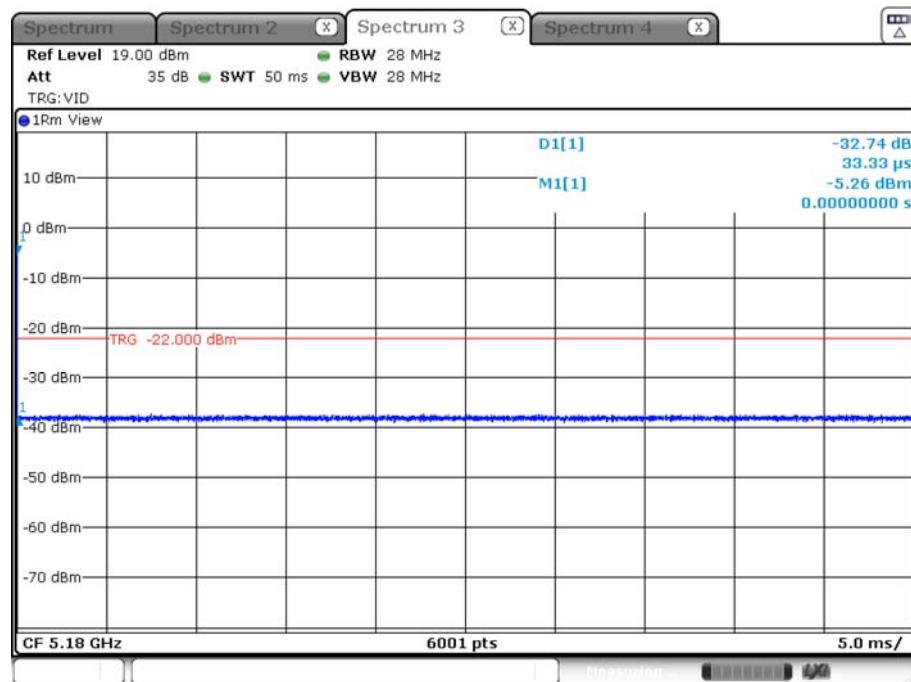
The short control signal is 1.75833ms<2.5ms, Pass.

802.11ac(20 MHz) Channel 36 LTE



Date: 14.JAN.2022 07:35:12

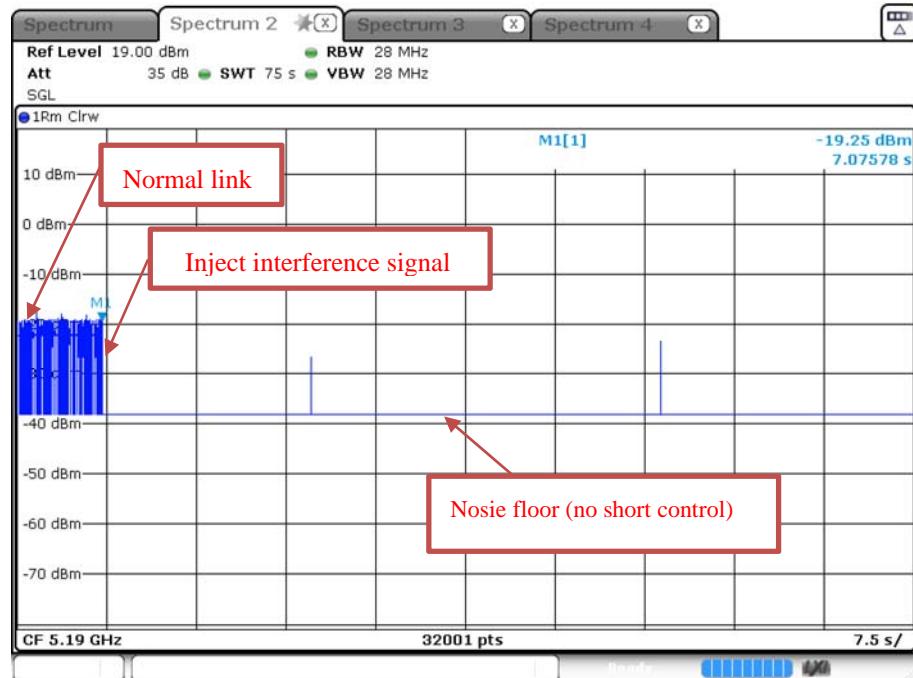
802.11ac(20 MHz) Channel 36 LTE short control signal



Date: 14.JAN.2022 07:35:59

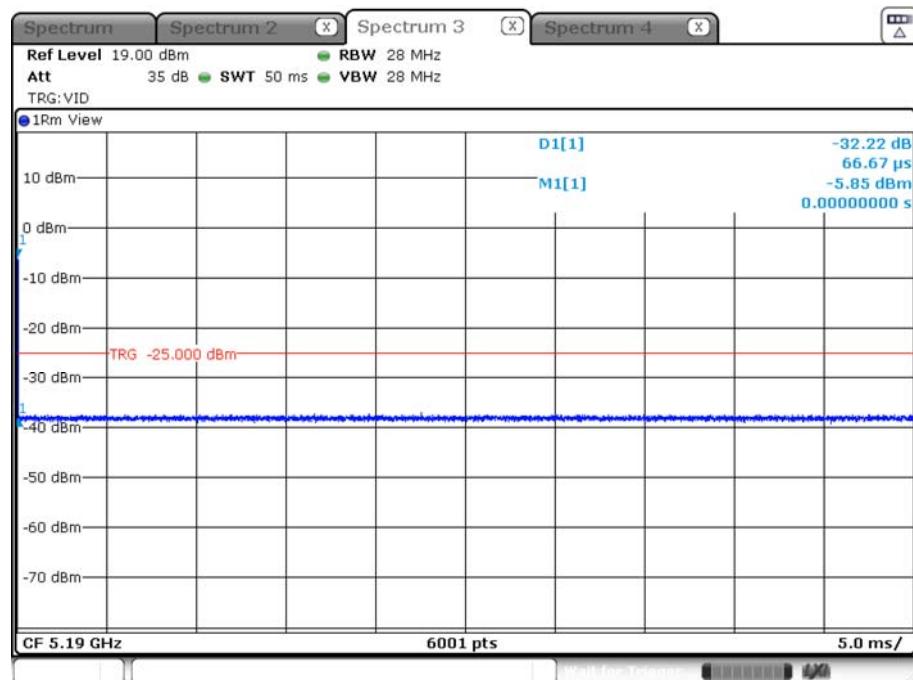
The short control signal is 0.03333ms<2.5ms, Pass.

802.11ac(40 MHz) Channel 38 AWGN



Date: 14.JAN.2022 07:44:21

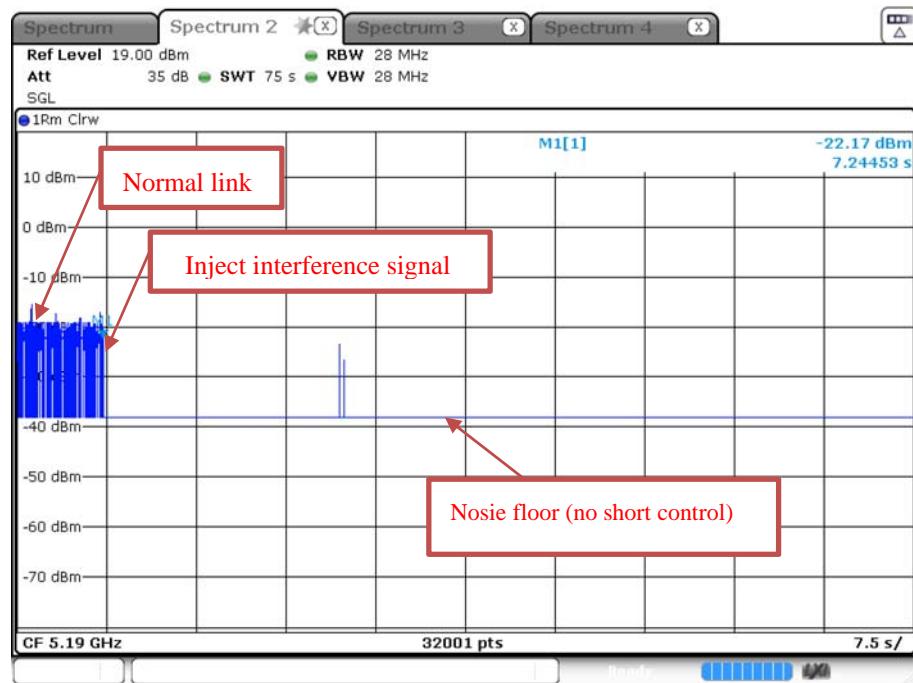
802.11ac(40 MHz) Channel 38 AWGN short control signal



Date: 14.JAN.2022 07:44:57

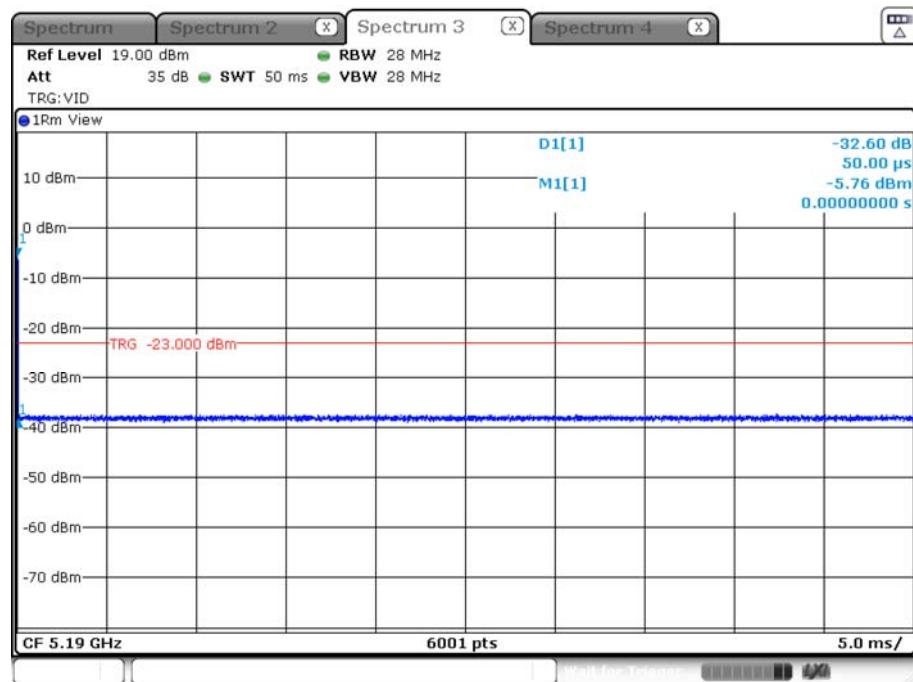
The short control signal is 0.06667ms<2.5ms, Pass.

802.11ac(40 MHz) Channel 38 OFDM



Date: 14.JAN.2022 07:49:48

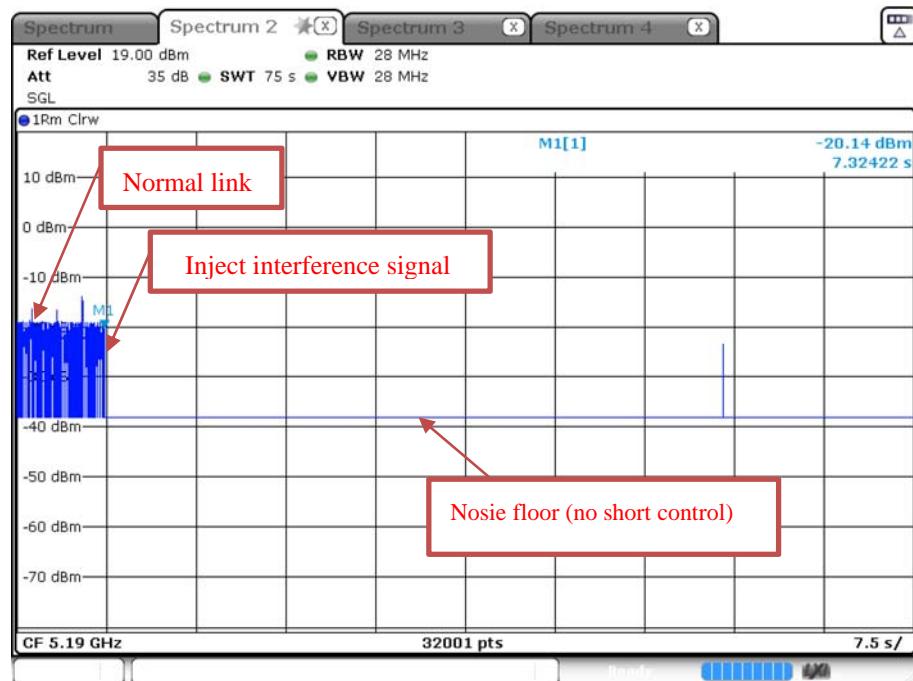
802.11ac(40 MHz) Channel 38 OFDM short control signal



Date: 14.JAN.2022 07:52:04

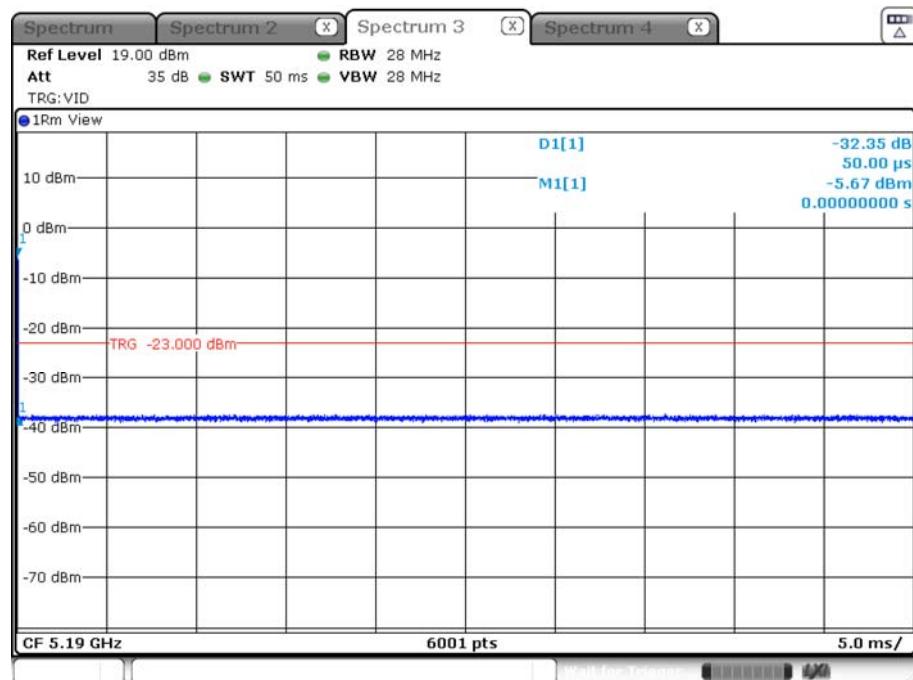
The short control signal is 0.05ms<2.5ms, Pass.

802.11ac(40 MHz) Channel 38 LTE



Date: 14.JAN.2022 07:47:15

802.11ac(40 MHz) Channel 38 LTE short control signal



Date: 14.JAN.2022 07:51:10

The short control signal is 0.05ms<2.5ms, Pass.

A.10 Receiver Blocking

Test Data

Note 1: Pmin = TX Level – cable loss (7 dBm)

Note2: Blocking signal levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels corrected by the actual antenna assembly gain.

Slave without radar detection

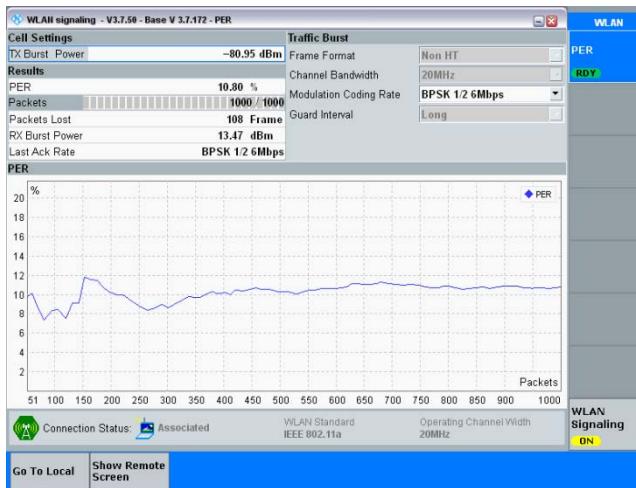
802.11a:

Operational channel (MHz)	Pmin	PER	Limit
5180	-80.95 dBm	10.00 %	≤ 10 %
5700	-82.10 dBm	10.00 %	≤ 10 %

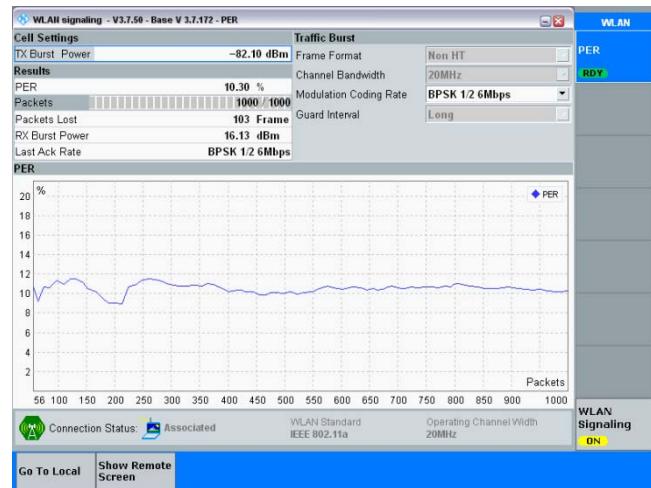
Wanted signal mean power from companion device (dBm)	Blocking signal Frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal	PER Result		Limit	Verdict
				Low channel	High channel		
Pmin + 6 dB	5100	-59	CW	4.80%	2.40%	The minimum performance criterion shall be a PER less than or equal to 10 %.	Pass
	4900	-53	CW	5.00%	3.90%		
	5000	-53	CW	5.00%	4.10%		
	5975	-53	CW	4.20%	3.00%		

Test Plot (P_{min})

802.11a Channel 36



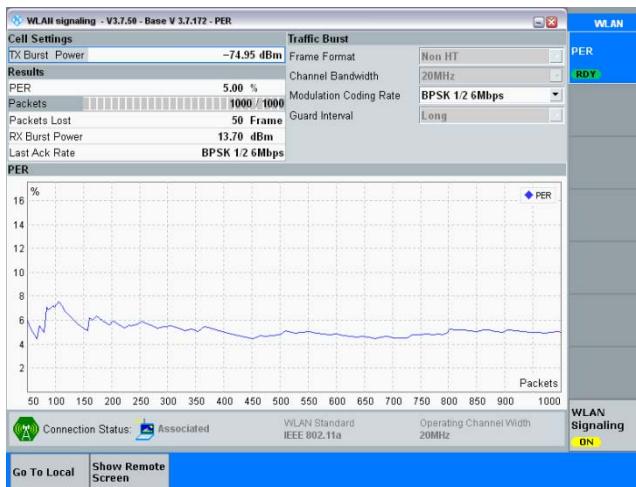
802.11a Channel 140



Test Plot (PER)

Note: All the configuration were tested, but only the worst PER Plot were reported in this report.

802.11a Channel 36



802.11a Channel 140



ANNEX B TEST SETUP PHOTOS

Please refer the document "BL-SZ21C0720-AR.PDF".

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document "BL-SZ21C0720-AW.PDF".

ANNEX D EUT INTERNAL PHOTOS

Please refer the document "BL-SZ21C0720-AI.PDF".

--END OF REPORT--